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Development and Implementation of the Generations Eating Together Through Cooking (G.E.T.T. Cooking) Curriculum and Its Effects on an Inter-generational Population: A Pilot Study

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DEVELOPMENT AND IMPLEMENTATION OF THE GENERATIONS EATING TOGETHER THROUGH COOKING (G.E.T.T. COOKING) CURRICULUM AND ITS EFFECTS ON AN INTER-GENERATIONAL POPULATION: A PILOT STUDY

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ABSTRACT

The obesity epidemic continues to be a problem both in the US and worldwide. A number of factors have been attributed including: frequency of fast-food consumption, increased portion sizes, increased consumption of sugar-sweetened beverages, increased sedentary lifestyles, lack of nutrition knowledge, and lack of cooking skills. Nutrition intervention programs continue to be created providing innovative and creative ways of educating the public with pertinent knowledge and skills necessary for improving healthful behaviors; however, few programs focus on cooking skill development within a familial environment.

The Generations Eating Together Through Cooking (G.E.T.T. Cooking) program was created by the lead researcher as a four-lesson, interactive cooking curriculum whose main objective was to increase cooking self-efficacy, nutritional knowledge, and family meal frequency while focusing on the intergenerational relationship of the participants. The curriculum was pilot tested from July to August 2015 with six grandparent-grandchild/ren pairings in Clemson, SC. A quasi-experimental, mixed-methods approach was used to assess changes in cooking self-efficacy, family meal frequency, and nutritional knowledge between pre- and post-intervention phases.

Results demonstrated an increase in cooking self-efficacy in the children and grandparents. Nutritional knowledge also increased across all children participants. Grandparents demonstrated an increase in food safety and food behavior practices. Emerging themes throughout the intervention phase focused on cooking skill acquisition highlighting an increased comfort in knife handling, fruit and vegetable preparation, and

raw meat handling. A two-month follow-up interview conducted with the parents, grandchildren, and grandparents provided evidence to the sustainability of the nutrition knowledge and cooking skills. The largest barrier to child participation in cooking activities was school. Enthusiasm for continued practice at home and participation in the program was expressed by all participants. Parents did not participate in the intervention yet expressed the positive changes in diet and attitudes toward food preparation activities noticed in the child participants. Future research will aim at implementing the curriculum with a larger, more economically and ethnically diverse population.

DEDICATION

I dedicate this to my mom, Minerva, my sister, Diana, my brother, Emmanuel, and my boyfriend and best friend, Taurean. Without you all, I would have not been able to complete this process. I love you all and I am eternally grateful for your love and support. Thank you!

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CHAPTER ONE

INTRODUCTION

Background to the Problem

Obesity continues to be a problem worldwide, with an estimated one-third of the US child and adolescent population being overweight or obese,[1] defined as above the 85th percentile in BMI for age, height, and gender.[2] Though genetics and metabolism may account for a percentage of the epidemic,[3] environmental factors, such as frequency of fast-food consumption,[4] portion sizes,[5] consumption of sugar-sweetened beverages,[6] lack of nutrition knowledge, lack of cooking skills,[7] and increasing sedentary activities[8] are thought to be the more significant variables. Childhood and adolescence is a critical time in the future health of a person. Dietary patterns, sedentary behaviors, and relationships with food are established during childhood and adolescence.[9,10] Additionally the likelihood that overweight children continue to be overweight in adulthood is staggering.[11,12] Educational approaches, at both community and individual levels, targeting education, skill development, and awareness, are required to effectively combat the epidemic.[13]

Another population struggling with their health is senior citizens. Overcome with already existing complications, many seniors don't have the knowledge, ability, or resources to feed themselves in the appropriate manner.[14-16] The nutritional status of older Americans is also of concern, specifically due to the high number suffering from diet related diseases such as cardiovascular disease, hypertension, and type-2 diabetes.[17] In this population, following more strict and appropriate dietary guidelines becomes

difficult for a number of reasons, including income, lack of knowledge, and established food preferences.[18]

The Generations Eating Together Through Cooking (G.E.T.T. Cooking) program was developed by the lead researcher as an innovative and interactive nutrition education program. The program is a four-lesson program aimed at increasing nutrition knowledge, cooking skills, family meal frequency, and food safety knowledge and practices of its participants. The program focuses on grandparent-grandchild dyads and the transfer of cooking skills and knowledge through intergenerational relationships. The G.E.T.T. Cooking program was piloted with three different populations to develop the lesson plans, activities, content, and assessment tools.

This study is a pilot test of the G.E.T.T. Cooking program and its effectiveness in increasing knowledge, family meal frequency, and cooking self-efficacy of the participants. This chapter aims at introducing the problem, the purpose of this study, and the research questions.

Cooking Skills and Health

Changes in food purchasing habits[19] and increased availability of convenience foods[20,21] has resulted in the raising of a nation filled with young adults who lack the necessary skills and knowledge to cook. In turn, children at home are provided with fewer opportunities to develop cooking skills which oftentimes results in developing the same negative dietary and shopping practices as their parents.[22-24] Research has already established the positive impact that cooking self-efficacy has on health, including

decreased consumption of out-of-home meals,[25] increased likelihood of preparing healthful meals,[26] increased knowledge and ability of selecting healthier out-of-home meal options,[27] and increased cooking frequency.[28]

The emergence of young adults lacking cooking skills is not a phenomenon isolated in the US. Canada, the United Kingdom, and Australia are also witnessing this trend.[24] Themes identified as barriers to cooking are lack of time, lack of skill, sense that cooking is overwhelming, dislike for grocery shopping, cost, and lack of palatability of healthy foods.[29-31]

Family Meal Frequency

Family meals, and the frequency with which they occur, has been recognized as a protective factor for obesity onset of children and adolescents.[32] The exact mechanism by which this occurs is unknown; however, a number of theories have risen to explain this phenomenon. Woodruff et al.[33] theorizes that the family meal environment provides an opportunity for adults to model healthful eating behaviors and provide healthful foods to their families. Though the meals may not be completely "healthy", cooking and eating at home results in consumption of foods that are not laden with fats, sodium, sugars, increased consumption of fruits and vegetables in the meal, and aids in practicing portion control.[34-36] Welsh et al.[37] hypothesis that family meal frequency is a direct reflection of the family's environment, thus, those who have a higher frequency have a healthier family environment and dynamic. Others believe that the emotional bonding which occurs during family meals is key to the development of healthy eating habits.[38]

Whatever the reason, family meal frequency continues to be an integral part of maintaining a healthy family environment, one that can foster positive dietary outcomes.[39-41]

Intergenerational Relationships and Health

The number of grandparents raising their grandchildren has increased significantly in recent decades;[42] however, few nutritional programs concentrate on this intergenerational relationship and the effects this relationship has on healthy eating behaviors.[43] Research has demonstrated that adding an intergenerational component to family meals, food preparation, and access to food does have an effect on the eating behaviors of the children, especially when the grandparent is willing to prepare separate meals to satisfy the preference of the child.[43] Educating the grandparents on nutrition education, wellness, and physical activity, while demonstrating how to incorporate this information with their grandchild, has been shown to be effective in aiding the grandparents with providing a healthy dietary environment for themselves and their grandchildren.[42,44,45]

Relevance of the Project

The increasing number of grandparents raising their grandchildren[46] as well as the number of grandparents having relationships with their grandchildren provides a distinct and unique opportunity for nutrition education and skill development. The children and adolescents and the elderly benefit from nutrition education. Establishing sound

nutritional and dietary behaviors in children and adolescents is key in leading a healthy life in the future. Many elderly have diet related medical conditions,[47] and though many nutritional programs don't address this population, they too would benefit greatly from understanding how to properly manage their conditions through nutrition.[48] Additionally, elderly suffering from diet related conditions have a high concern for their own grandchildren and their health, especially those who are the primary care givers.

Statement of the Problem

Development of cooking skills in children is usually tied to the primary care giver who normally functions as the food gatekeeper for the household. However, in the last 4 decades, the number of homes with two working parents has almost doubled,[49] and the number of single-parent households within the same time span has also doubled.[49] The average woman spends 65.6 min/day cooking or preparing foods, a significant decrease from the reported 112.8 min/day spent in 1965-1966. Additionally, the percentage of woman who spend time preparing foods has also decreased significantly from 92% in 1965-1966 to 68% in 2007-2008.[50] Concurrently, consumption of out-of-home meals has increased significantly, from 18% of calories in 1977-1978 to 32% of calories in 2005-2008.[51] Out-of-home meals have been demonstrated to be higher in fat, sodium, sugar, and calories, while lacking fruit, vegetables, fiber, and whole grains.[52,53] Studies have also linked higher frequencies of out-of-home meal consumption with higher probability of morbidity (i.e. stroke, acute coronary events, etc.)[54] and higher body weight [55]. The

most recent NHANES [56] data demonstrates that the average US adult consumes 3.9 out-of-home meals per week, with 1.8 meals coming from fast-food locations.

The obesity epidemic has in part been caused by the following factors: decreased time dedicated to meal preparation, increased busy schedules, lack of cooking skills and its transfer to younger generations, and changing dietary and shopping practices However, at the core, is the control of one's own food. Having an understanding, appreciation, knowledge, and skill for food, nutrition, and cooking, even at the most basic level, is crucial in one's ability to eat healthy and follow a nutritionally sound diet. Thus, developing cooking self-efficacy, especially in younger generations that aren't receiving this from their parents, is critical for the future health of the US. Taking advantage of the relationships and knowledge fostered between grandparents with their grandchildren, the following research aims at doing just that.

Purpose of the Study

The purpose of this study was to create and evaluate the effects of the Generations Eating Together Through Cooking (G.E.T.T. Cooking) program. This program's focus is cooking self-efficacy and family meal frequency of participating children and their grandparents. G.E.T.T. Cooking was created by the lead researcher as an innovative nutrition education program. Four lessons, implemented as a two-part, interactive, activity and cooking based program, were used to increase nutritional knowledge, food safety knowledge and practices, participation in meal planning, preparation, shopping, and clean up, and family meal frequency, while decreasing out-of-home meal

consumption in children and their grandparents. The study also aimed at using the grandparent-grandchild relationship as a base for cooking skill and knowledge transferability. Thus, the children participated in the program with their grandparents. The complete program, along with a training guide, will be made available online as an educational tool for implementation with interested communities.

Location of Study

The G.E.T.T. Cooking program was implemented at the Osher Lifelong Learning Institute (OLLI)[57] at Clemson University in Clemson, SC. OLLI is a membership community aimed at the continued education and active involvement of adults aged 50 and older in the community. Courses, excursions, outdoor activities, cinema, and special interest group are a number of opportunities available to its members. Activities are normally held in the Cheezum Building located in Clemson, SC, where a demonstration kitchen is available. Participants were recruited from OLLI, as well as from the neighboring community of Clemson through the weekly held Patrick Square Farmer's Market.

Research Questions

The following were the proposed research questions for this study.

1. How effective is the G.E.T.T. Cooking program at increasing cooking self-efficacy, nutritional knowledge, and participation in cooking related activities in children and older adult participants?

2. How effective is the G.E.T.T. Cooking program at modifying dietary behaviors in children and older adult participants?
3. Is the grandparent-grandchild relationship an effective medium for cooking skill and knowledge transferability?
4. What is the perception of the participants of the G.E.T.T. Cooking program? The perceptions addressed include enjoyment, understanding, engagement, and desire to participate again.

Definition of Terms

A list of terms and their definitions used throughout this dissertation are provided below.

- Children: persons not yet of legal age for consent of treatment or research participation; generally someone under 18 years of age.[58]
- Family Meal: consumption of a meal by most, or all, of the members in the family or household at the same time at home.[59]
- Cooking Self-Efficacy: the ability of a person to believe they have the skills, knowledge, and capability to perform food preparation behaviors required to achieve a set goal or outcome.[60]
- Childhood Obesity: the body mass index of a two-to-18 year old child when it is equal to or greater than the 95th percentile for that age and gender.[61]

- Inter-generational Relationships: relationships built amongst members of different generations. In the case of this study, the relationships are specifically between grandparents and their grandchildren.[62]

Summary

As the current generation matures, it is imperative that cooking skills, nutrition knowledge, and basic "good healthful practices" are taught. Unfortunately, these lessons are not being taught at home or school. The grandparents of the current generation were the last to have a majority of the population not be bombarded with constant reminders of the convenience and out-of-home foods available. Additionally, the relationship between grandparents and grandchildren tend to be a strong and positive one, providing a great opportunity for growth, knowledge, and transferability of skills. Thus, opportunities to engage children with their grandparents are presented, fostering growth, knowledge, and potentially, a healthier life.

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CHAPTER TWO

LITERATURE REVIEW

Introduction

Many patterns, behaviors, and ideals that influence the life of a person are established during childhood, including dietary and nutritional ones. It has been long established that the health of a person during childhood highly influences their health into adulthood.[1,2] According to the latest statistics from the Centers for Disease Control and Prevention, 8.4% of two-to-five year olds, 17.7% of six-to-11 year olds, and 20.5% of 12- to 19-year olds are obese.[3] A significant percent of children who are overweight will be overweight as adults.[4,5] Obesity related complications, including heart disease, stroke, and diabetes, cost the US $147 billion in 2008.[6] The issue is not getting any better, and factors including increased sedentary lifestyle, increased consumption of out-of-home meals, busy schedules, increased portion size, lack of nutritional knowledge, and lack of cooking skills are partially being blamed.[7]

Over the past few decades, the rate of obesity in children and adolescents has increased significantly. A study conducted by Ogden et al. using the National Health and Nutrition Examination Survey (NHANES) found that 11.3%, 16.3%, and 31.9% of children and adolescents were at or above the 97th, 95th, and 85th percentile of body mass index (BMI) for age using the 2000 Centers of Disease Control and Prevention growth charts, respectively.[8] A child or adolescent is considered obese if they fall above the 95th percentile of BMI for age and sex.[9] A number of factors are associated with the childhood obesity epidemic, including genetics,[10] environment,[11] metabolism,[10] and socio-cultural

factors including consumption of fast-food,[12] increased portion sizes,[13] consumption of foods high in calories and fat and low in fiber,[14] increased consumption of sugar-sweetened beverages,[15] and increased sedentary activities.[16] In order to properly treat this, efforts in community education and individual awareness and skill are necessary.[17]

Likewise, nutrition status of older Americans is of concern due to a number of reasons. Many older Americans, especially rural-dwellers, suffer from diet-related complications, including cardiovascular disease, hypertension, and type-2 diabetes.[18] These individuals usually have a basic understanding of current nutritional messages [19,20] and the importance of good nutrition and health,[21] however those with chronic conditions often require assistance with following appropriate dietary guidelines for their conditions.[20] Nutritional status of older Americans has also been related to social isolation, disinterest in changing current dietary practices, and lack of assistance with following recommended practices.[22,23] Though the majority of senior citizens are not considered low-income, consumption of high-quality diets is low.[24] Recommendations by the Academy of Nutrition and Dietetics have stated the importance of nutrition education programs through community agencies targeting older adults.[25,26]

The health of the national, in general is of concern. However, in order to properly address these concerns, educational efforts that address awareness, knowledge and skill acquisition, and behavior change are needed.

Nutrition Education

At a time when the obesity epidemic has not only affected adults, but has also affected a large number of children and adolescents, nutrition education and interventions become increasingly important. Prevention, rather than treatment, has become the emphasis nutrition education as children continue to develop chronic nutritional related diseases, such as metabolic syndrome and type-2 diabetes, at earlier ages.[27,28] Over the last several decades, consumption of fruits, vegetables, whole grains, milk, and non-sugar sweetened beverages has decreased[29,30] while consumption of snack foods, desserts, pizza, and sugar sweetened beverages has increased amongst children.[31,32] Additionally, studies have demonstrated that changing these eating behaviors is extremely difficult with this population.[33]

A number of factors must be considered in order for nutrition education programs to be effective. An appropriate theoretical framework, consideration of the environment, dietary and physical activity outcomes, appropriate lesson durations, and theoretically based strategies must all be implemented.[34] It has also been established that knowledge-only based programs are ineffective.[34,35] A meta-analysis of school-based nutrition interventions performed by Khambalia et al.[36] found that successful interventions included both diet and physical activity components,[37] had family involvement,[38] and were longer-term.[39] Interventions that include a hands-on aspect resulting in an increase in cooking knowledge and skill have supported positive dietary changes.[40] Examples of successful interventions include Cooking up Fun!,[41] Eating Right is Basic,[42] and Cooking with a Chef.[43]

Cooking Skills and Health

The issue of cooking skills and its association with health are not new,[44] and in fact they can be found in written works as early as the late 19th century.[45] The change in food purchasing habits,[46] increased consumption of out of the home meals,[47,48] and an increase in working mothers and single-parent households[49-51] exacerbate the obesity epidemic plaguing the US. The consumption of foods outside of the home have been known to be generally higher in calories, fat, sodium, and sugar.[52-54] This places a higher risk on individuals, both adults and children, for nutrient imbalance, deficiencies, and overall unhealthy diet. The increase in readily available prepared foods, including convenience and pre-made foods, has resulted in a decrease in need of cooking skills. In turn, cooking becomes less of a necessary skill, providing fewer opportunities for children to experience and gain cooking skills at home.[55-57]

Developing cooking skills is an important developmental skill for children; one that will shape their future health. Research has demonstrated that a higher cooking self-efficacy leads to decreased consumption of out-of-home meals,[58] increased likelihood of preparing healthful meals,[59] increased knowledge and ability of selecting healthier options when eating out-of-home meals,[60] increased cooking frequency,[61] and reduced food cost.[62]

Researchers in the US, Canada, United Kingdom, and Australia believe that there is an emergence of young adults who don't have the ability to cook.[57] Additionally, a trend of themes has been associated with decreased frequency of home cooking, including: lack of time, lack of skill, belief that cooking is overwhelming, dislike for

grocery shopping, belief it is more expensive to prepare foods at home then to eat out, and belief that healthful foods are unsatisfying and lack taste.[63-65] In low-income populations, trends included discouragement for preparing healthful foods by the family, children's special food requests, and a disinterest in cooking.[66,67]

Despite the barriers, research has demonstrated that a high cooking self-efficacy is beneficial for the entire family. Larson et. al.[68] looked at the frequency of meal preparation and grocery shopping conducted by adolescents and found that there was a positive association between meal preparation and fruit consumption in males and meal preparation and fruit and vegetable consumption in females. Another study comparing a cooking and tasting curriculum with a tasting-only curriculum found that the cooking and tasting curriculum was significantly better at increasing self-efficacy, increasing fruit and vegetable preferences, and improved cognitive behaviors in mediating healthful food choices.[69] Studies have demonstrated that about 10% of the US adult population do not have the skills to prepare home-cooked meals, and many young adults have very limited experience in food preparation and also lack the skills to follow a recipe. [70-72]

Social Cognitive Theory

Rimer and Glanz[73] define theory as "…a systematic way of understanding events or situations. It is a set of concepts, definitions, and propositions that explain or predict these events or situations by illustrating the relationships between variables."[73] Theory provides an opportunity for development of programs based on an in-depth understanding of behavior, allowing for interventions suitable for a variety of environments and target

populations. Health promotion theories exist on a number of levels; however, many nutritional education programs concentrate on the individual or intrapersonal level.[74]

The social cognitive theory was introduced by Bandura[75] and has set constructs that effectively explain how behavior can be modified. The three areas of emphasis are the environment, personal characteristics, and personal experience. Together, these three areas influence each other, giving rise to the constructs of the social cognitive theory.[76] The constructs are reciprocal determinism, behavioral capability, expectations, self-efficacy, observational learning (modeling), and reinforcements.[73,77] Thus, if a person wants to change their dietary behavior, for instance increasing whole grain consumption, the following need to occur: consideration of personal, behavioral, and environmental factors (reciprocal determinism), determination of how to incorporate the behavior into daily life (behavioral capability), assessment of the outcome or benefits of implementing the new behavior (expectations), viewing of a model performing the behavior (observational learning), improvement in self-confidence in performing the behavior and overcoming barriers to said behavior (self-efficacy), and positive recognition or rewards for sustainability of the behavior (reinforcement). The social cognitive theory has been used successfully in nutrition education and it continues to be the theory most widely used to create effective nutrition interventions.[74,78]

Self-Efficacy

Self-efficacy is considered one of the strongest factors associated with change in positive dietary behavior, including fruit and vegetable consumption.[79,80] As the

availability of convenience and ready-to-eat foods increase, so does the importance of individual's ability to prepare and provide healthful foods for themselves and their families in a time-efficient manner.[81,82] Likewise, the availability of healthful foods doesn't translate to increased consumption of said food. It takes cognitive ability, in particular self-efficacy, to translate environmental opportunities into changed behaviors.[83] Studies have demonstrated that self-efficacy is one of the strongest mediating factors accounting for dietary changes in adolescents.[84] Likewise, it is one of the best predictors of fruit and vegetable consumption and unhealthy snack food intake.[85]

Family Meals

As more researchers continue to seek out the factors responsible for the current obesity epidemic, it becomes more evident that food and food availability do not provide a full picture. Emphasis on family meals and eating together has received particular attention in recent years.[86] A number of studies have provided evidence that increased family meal frequency is associated with positive dietary outcomes,[87-89] decreased incidence of eating disorders,[90-92] increased psychological well-being[90], decreased substance abuse,[92] and increased academic success in children and adolescents.[93] Family meal frequency has been seen to change depending on sociodemographic characteristics. For instance, Neumark-Sztainer et al.[94] found that boys had a higher family meal frequency than girls, middle school students had a higher family meal frequency than high school students, Asian Americans had the highest family meal frequency across ethnic/racial groups, and adolescents with a higher socioeconomic background had a

higher family meal frequency when compared to their lower socioeconomic counterparts.[95] Research has demonstrated that the more vulnerable parts of the population would benefit most from interventions aiming at increasing family meal frequency. [95]

The mechanism by which family meal frequency affects dietary intake has not been well established. Some researchers theorize that family meals provide an opportunity for modeling healthful eating behaviors and provide opportunities for healthful foods to be provided to household members.[96] Other researchers point out that increased family meal frequency is a direct reflection of the family's social environment, thus those with increased family meal frequency have a healthier family dynamic and environment.[97] Yet others theorize that family meals provide opportunities for emotional bonding.[98]

The change in familial composition has resulted in changes in family meal frequency and meal quality.[99] In the past several decades, the number of homes with 2 working parents has increased from 37% to 66%.[100] Likewise, the number of single-parent households has increased from 13% to 26% over the same span of time.[100] A paradox thus ensues. The increasingly busy schedules, highly available convenience foods, and lack of cooking skill and knowledge result in family meal frequency becoming an even more significant part of child and adolescent health.[95]

Intergenerational Relationships and Health

The US has seen a rise in the number of grandparents raising their grandchildren over the past couple of decades,[101] estimating a total of about 2.4 million grandparents assuming the responsibility of primary caregivers in 2013.[102] A study conducted in Atlanta, GA of 100 African-American grandparents raising their grandchildren found that 54% had high blood pressure, 80% were overweight, and 48% consumed high-fat foods.[103] Likewise, few programs have been developed that address the nutritional and physical activity concerns of this group.[101]

Influential factors regarding eating and the relationship with food are seen early in childhood and are closely tied to family.[104] Eating behaviors can come directly, from the food served and eaten at home, and indirectly, from familial commentary and restrictions about and on food.[105] Many nutrition programs exist that are family oriented,[106] however these programs target parents[107] or children[108], without consideration of the involvement of other generations.

When the entire family is involved in the teaching and influencing of eating behaviors, communication is key. Kaplan et al.[106] conducted a study where successful intergenerational communication was broken down into three main themes: frequent ongoing conversations about healthy eating, setting rules about eating and foods, and communicating effectively with the child in a calm tone and a language they can understand. Likewise, barriers to successful communication and subsequent barriers to healthful eating were identified. The four emerging themes were: food choice (i.e. child refusing a food, grandparents preparing different meals due to preference, children's dislike for healthier foods, and children having too many choices), timing of family

meals, food portion, and financial hardships and its effect on purchasing healthful foods. Results from this study also demonstrated an appreciation and need by the participants for an intergenerational nutrition education venue. Participants discussed that a multi-family focus group venue was appropriate for the following reasons: opportunity to hear other's opinions, ideas, and perspectives, opportunity to reach out to and learn from family members, provided a comfortable environment for learning and self-expression, and opportunity to hear struggles other families face and that they are not alone in their food-related challenges. Ultimately, results demonstrated that families that have limited or ineffective communication find it difficult to overcome hurdles regarding communication and decision making about healthful eating; however, those who had effective communication found it easier to overcome those hurdles, and were successful at involving the children in the meal preparation and decision making process.

Intergenerational relationships have not been examined thoroughly, however they do provide an interesting and potentially influential dynamic when considering the health, physically, mentally, and nutritionally, of the parties involved. Three particular studies found that nutrition education combined with a wellness or physical activity component aids in increasing the nutritional knowledge and efficacy of grandparents raising their grandchildren.[101,109,110]

Methods

The following is a survey of the literature of nutrition intervention programs for children and adolescents. Databases used were MEDLINE, Food Science and

Technology Abstracts (FSTA), PsycINFO, and the Education Resource Information Center (ERIC) through the Clemson University Library EBSCO host. No parameters were placed on dates and only English abstracts were included. The search terms were combinations of the following: (nutrition education) AND (intervention) OR (child*) OR (self-efficacy) OR (family) OR (cook* self-efficacy) OR (children) OR (adolescents). Studies included were those where the outcome measured was family meal frequency and/or cooking self-efficacy. All articles included were peer-reviewed, thus no dissertations or theses were included in the findings. Figure 2.1 summarizes the process for identification and inclusion.

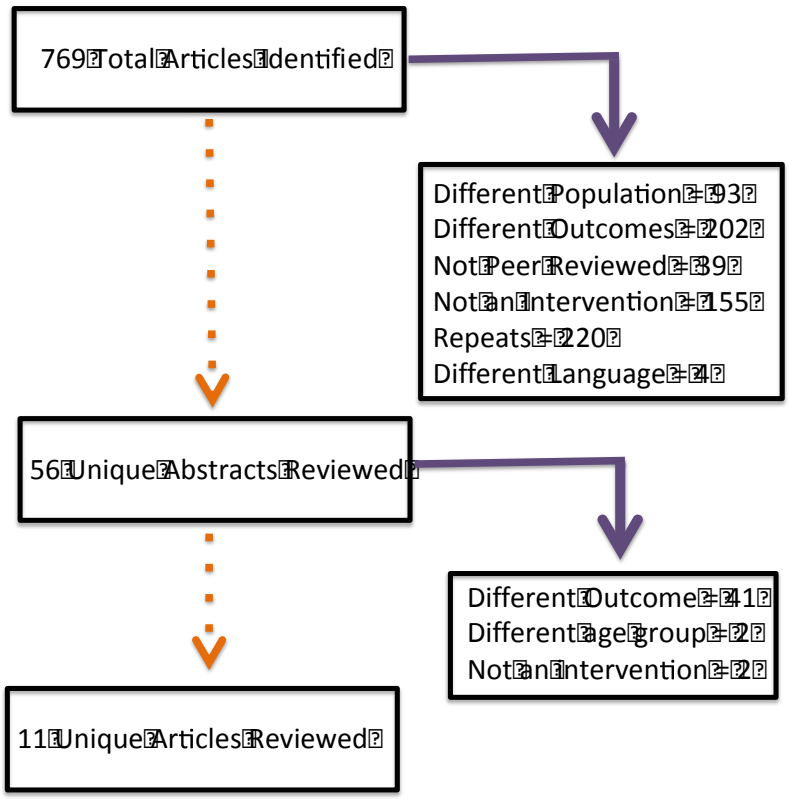

Figure 2.1 Inclusion and exclusion of articles for cooking self-efficacy and family meal frequency interventions summery table.

A second survey of the literature was conducted to identify nutrition interventions for elders and intergenerational populations. Interventions included measured outcomes directly related to increase in knowledge, skill, or dietary behaviors in the participants. Additionally, intergenerational nutrition interventions were included. As above, no parameters were placed on dates and only English, peer-reviewed abstracts were included. Databases used were MEDLINE, FSTA, PsycInfo, and ERIC. Search terms used were a combination of the following: (nutrition education) AND (intervention) OR (nutrition) OR (cook*) OR (skills) OR (teach*) OR (intergenerational) OR (elder*) OR (child*) OR (grandparent) OR (grandchild) OR (self-efficacy). Figure 2.2 summarizes the process for identification and inclusion.

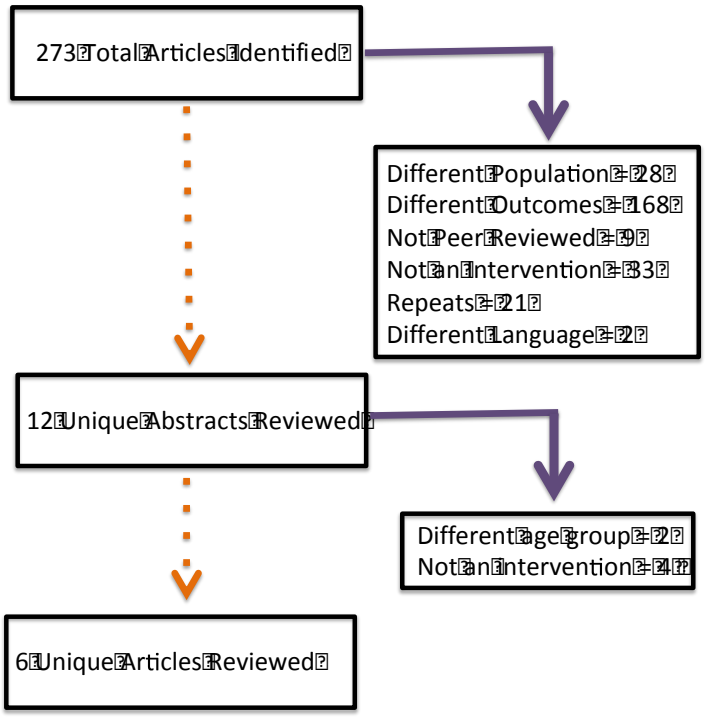

Figure 2.2 Inclusion and exclusion of articles for nutrition interventions for elders and intergenerational populations.

Analyses

Each article was first assessed by title and abstract. Articles that determined that an intervention had been conducted were then assessed further to identify whether family meal frequency and/or cooking self-efficacy were outcomes that were measured. The summarized results of those unique identified studies are in Table 2.1. The same process was performed for the articles on elderly interventions; however, the outcomes measured and identified had to be of a nutritional nature. Thus only nutrition interventions were included, regardless of the number or type of outcomes. The summarized results of the unique identified articles are in Table 2.2.

Results

Survey of Nutrition Interventions for Children and Adolescents Targeting Family Meal Frequency and Cooking Self-Efficacy

Table 2.1 summarizes the findings from the interventions that were identified that had family meal frequency and/or cooking self-efficacy as an outcome measure.

Cooking self-efficacy studies

A number of interventions reported focused on increasing child cooking self-efficacy. The durations and outcomes varied widely. Gatenby et al.[111] conducted a 10-week secondary school-based pilot intervention in the UK. After-school cooking clubs were created that focused on developing food preparation and cooking skills in participants, as well as enhancing and understanding other cultures through food. Participation in the clubs led to significant improvements in cooking skills, meal preparation, and the ability to cook healthy foods and meals. Additionally, participants'

cultural awareness significantly increased after participation in the intervention. Cunningham-Sabo and Lohse[113] created a program titled Cooking with Kids. This school-based food education program targeting fruit and vegetable preference, food and cooking attitudes, and self-efficacy. Fourth graders were randomized to a control or intervention

Table 2.1 Summary of nutrition interventions for children and adolescents with outcomes measuring family meal frequency and/or cooking self-efficacy.

Reference	Population	Sample Size	Intervention	Duration	Outcome
Gatenby et al., 2011[111]	12-to13 year olds in the second year of secondary school	55	Ten 1 ½-hr cooking lessons using ethnically diverse recipes	10 weeks	Significant increases in simmering food, cooking a meal, cooking healthy foods, separating eggs, and boiling eggs. Significant increase in cultural dish awareness. Preparation of spicy foods increased by 31%, Indian foods by 19% and Greek foods by 16%. Significant increase in frequency of cooking at home and preparation of different cultural dishes at home.
Chen et al., 2014[112]	5-to-8 year olds and their families	1204 (604 intervention, 600 control)	4 in-class monthly tasting activities, 20 mins/activity	4 months	Intervention students significantly increased familiarity, preferences, and consumption of featured vegetables, and signficantly increased involvement in food preparation at home. Children actively invovled in food preparation at home.
Cunningham-Sabo et al., 2013[113]	Fourth graders	257	1-hr intro class; three 2-hr cooking classes, three 1-hr fruit and veg tasting session	One school semester	Increases in vegetable preference, food and cooking attitudes, and self-efficacy significantly greater in intervention participants. Intervention most greatly improved food and cooking attitutdes and self-efficacy in boys without previous cooking experience.
Curtis et al., 2011[114]	Individuals and families who participated in the Family Food and Health Project	589	Education only (Int A) vs. education and 'cook & eat session'(Int B) vs. education and 'cook & eat' and personalised goal setting (Int C).	Intervention A = 2 hrs Intervention B = 6 weeks Intervention C = 6 weeks + 2 future meetings	Participants in the most intensive intervention had the greatest effect in lowering fat intake. Incorporating the goal setting aspect to the intervention helped in putting the theoretical and practical (cooking skills) skills to use, initiating dietary behavioral change. Six and 18-month follow-ups demonstrated no sustainability in results, probably due to a lack of further skill provision and goal setting reinforcements.

Table 2.1 Continued

Reference	Population	Sample Size	Intervention	Duration	Outcome
Townsend et al., 2006[115]	9-to-12 year olds	5111	7-lesson education experience with food preparation and tasting	6 to 8 weeks	34% of children improved on eating a variety of foods, 53% improved on nutrition knowledge, 31% improved on food selection, and 68% improved on food preparation skills and safety practices. Intervention participants had significant improvements in nutrition knowledge, food selection, and food preparation skills & safety practices over control.
Cunningham-Sabo et al., 2014[116]	4th grade students	961	5 two-hr cooking lessons and 5 one-hr fruit and vegetable tasting lessons	1 school year	Intervention had an overall positive effect on fruit and vegetable preference, most significantly on those in the more intense cooking and tasting curriculum and males. Independent of treatment, those without previous cooking experience had more than twice the gains in cooking self-efficacy and improved cooking attitude response.
Rosenkranz et al., 2009[117]	6-to-12 year olds	100	5 summer day care sessions starting with discussion of family meal and target behaviors	5 weeks	Intervention participants had a significant increase in family meal frequency at follow-up. Child participants determined the dancing and working with food the most frequently liked parts of the intervention. Though not significant, there was a trend in an increase of parent-child shared physical activity, parents eating vegetables at dinner, parent social support for physical activity, and a decrease in parents eating while watching tv.

Table 2.1 Continued

Reference	Population	Sample Size	Intervention	Duration	Outcome
Liquori et al, 1998[118]	Elementary school children, grades K-6	590	Cook shops plus food an environment lessons, cook shops only, food and environment lessons only, and comparison group	1 school year	Main positive effects were obtained for cookshops only on preferences, knowledge, and plate waste in all childeren and on behavioral intentions in younger children and cooking self-efficacy in older children. Main positive effects for food and enviornment lessons only included increase in knowledge for all children. Cooking experiences and eating food with peers, acccompanied by cognitive learning demonstrated to be a promising approach to nutrition education.
DeBar et al., 2012[119]	12-to-17 year old females	208	16 weekly or bi-weekly group sessions targeting dietary intake and eating patterns, physical activity, addressing issues associated with obesity in adolescent girls, and training primary care provider's in supporting weight management goals	5 months	Intervention participants had less reduction in family meal frequency compared to usual care. Less fast-food intake in intervention participants vs. usual care.
Fulkerson et al., 2010120	8-to-10 year olds and parents	44 parent-child dyads	5, 90-min sessions consisting of interactive nutrition education, taste testing, cooking skill building, parent discussion groups, and hands-on meal preparation.	10 weeks	Intervention children reported a significant increase in food preparation skill development. Trends suggested intervention children had higher consumption of fruits and vegetables and higher intakes of key nutrients.
Ayala et al., 2010[121]	Mexican immigrant/ Mexican-American mothers with children in K-2 grades	811	micro-environment only, macro-environment only, micro-plus-macro environment, no treatment; both micro coditions participants received monthly home visits by a promotora with monthly mailed newsletters.	7 months	After 2-yr follow-up, there was no significant effect on family meal frequency.

part of the study. The intervention included a 1-hour introductory lesson, three 2-hour cooking classes, and three 1-hour fruit and vegetable tasting sessions. The study demonstrated to be effective at increasing vegetable preference, food and cooking attitude, and self-efficacy, especially in boys who did not have previous cooking experience. A second, larger study by Cunningham-Sabo[116] also using Cooking with Kids demonstrated the same outcome as the pilot test, with a 50% female, 84% Hispanic population. In summary, participants of the intervention had a significant increase in cooking self-efficacy and improved cooking attitudes, with the strongest changes in males with no prior cooking experience.

Townsend et al.[115] tested the effectiveness of an intervention from the federal program Youth Expanded Food and Nutrition Education program (EFNEP). The study included a large sample of participants, over 5000, and was conduced in California. A total of six to eight one-hour lessons emphasizing educational experience with food preparation and tasting was tested. The largest gain was made in food preparation skills and safety practices; however, significant improvements did also occur in food knowledge and food selection as well.

Another pilot study promoting consumption of ethnically diverse produce through an intervention that included cooking demonstrations, tastings and cooking activities with ethnically diverse five-to-eight year olds was conducted by Chen et al.[112] in Northern California. Twelve hundred students participated in this elementary school intervention. Quantitative and qualitative data revealed that students who participated in the intervention had significant increases in familiarity, preference, and consumption of

highlighted produce. Additionally, they were significantly more actively involved in meal and food preparation at home.

Liquori et al.[118] tested an intervention for elementary school children in grades K-six. Through the development of Cookshop Program, 590 students were assigned to one of four intervention groups. The four groups were: cookshops plus food and environment lessons, cookshops only, food and environment lessons only, and comparison condition. Main positive effects were seen for those in the cookshop groups for preference, knowledge, and plate waste in the two (young vs. older) groups. Additionally, the cookshop groups demonstrated significant gains in behavioral intentions in younger children and cooking self-efficacy in the older children. Groups that had the food and environment lessons had significant gains in knowledge for both age groups. The researchers determined that a combination of the cooking experiences, consumption of food with peers, and cognitive learning were equally important for an effective intervention.

Fulkerson et al.[120] created the Healthy Home Offerings via the Mealtime Environment (HOME) program and tested it with 44 parent-child dyads. The intervention consisted of five 90-minute sessions involving interactive nutrition education, taste testing, cooking skill building, parent discussion groups, and hands-on meal preparation. The children were eight-to-10 year olds and were partnered with their parents. The children who participated in the intervention were determined to have significant increases in reporting improved food preparation skills vs. those in the control group. Trends also suggested that intervention children had a higher consumption of fruits and

vegetables. However, the results were sustained at the six-month follow-up. A second intervention with positive results but unsustainable outcomes was a study conducted by Curtis et al.[114]. The study was a comparison of three interventions: education only (intervention A), cook and eat sessions only (intervention B), and personalized goal setting, cooking and eat, and education (intervention C). Though the primary outcome was fat-intake, the interventions that included the cook and eat aspect demonstrated to have participants who had dietary behavioral changes by the post-intervention analysis. However, six and 18-month follow-ups demonstrated to have no sustainability of results. The authors hypothesize this is due to the lack of goal setting reinforcements and further skill provisions.

Family meal frequency studies

The effects of family meal frequency on dietary behaviors of children have been previously discussed in the literature. In this analysis, three studies that created an intervention with an objective of increasing family meal frequency have been identified. Rosenkranz and Dzewaltowski[117] developed an intervention for six-to-12 year old girls. The intervention consisted of discussions and activities stressing the importance of family meals and how to improve the family mealtime environment. Cooking skills and self-efficacy were practiced through the preparation and consumption of fruit and vegetable snack recipes. Additionally, the participants were taught how to be change agents for their family, learning how to engage the family through: removing distractions during meal times, replacing sugar-sweetened beverages with water, participating in meal

preparation, asking parents to include fruits and/or vegetables in the meals, learning about and using good table manners, and asking parents to engage in physical activity before and after a meal. Results demonstrated a significant increase in family meal frequency and consumption of fruit at breakfast by the parents. Positive trends in shared physical activity, parents eating vegetables at dinner, parent social support for physical activity, and parents eating while watching tv. were seen but were not significant.

DeBar et al.[119] also developed an intervention for adolescent girls aged 12-to-17 years old who were classified overweight through a body mass index (BMI) score. The intervention lasted five months and consisted of weekly and biweekly meetings. At the sessions, the participants were weighed and dietary diaries and physical activity records were reviewed. Additionally participants discussed changes in dietary intake and eating patterns, how to increase physical activity, incorporating developmentally tailored activities (i.e. exergaming), and how to address issues in adolescent girls who are concerned with obesity (i.e. depression, eating disorders, self-esteem). Primary care providers were also trained on how to support behavioral weight management goals. Additional guidelines were emphasized which included: decreasing portion sizes, limiting consumption of energy-dense foods, increasing consumption of lower energy-dense foods, establishing a regular meal time, decreasing sugar-sweetened beverage consumption, reducing fast food consumption, and increasing family meal frequency. The intervention participants demonstrated to have less of a decrease in family meal frequency then those in usual care. As children get older and progress into adolescence, it is typical for family meal frequency to decrease, as children become less interested in

parental influence. Thus, a result illustrating less of a decrease in family meal frequency is a positive outcome.

The final study included was conducted by Ayala et al.[121] The study consisted of an intervention with four conditions: micro-environment only, macro-environment only, micro-plus-macro environment, and no treatment. Participants were mostly Mexican immigrant/Mexican-American mothers and children in K-second grades. Participants in the micro interventions were visited by a promotora over seven months and received monthly mailed newsletters. A promotora was defined as

> "A lay Hispanic/Latino community member who receives specialized training to provide basic health education in the community without being a professional health care worker.[121]"

Four major outcomes were assessed which included: parenting strategies such as monitoring , discipline, and reinforcement related to children's diet and physical activity; parental support for physical activity; parent-mediated behaviors such as family meal frequency and distractions during meals; and perceived barriers related to children's eating and activity. At the two-year follow-up, those who participated in a micro-environment intervention had significant improvements in parenting strategies, parental support, and family meal frequency.

Survey of Nutrition Interventions for Elders

Nutrition related research within the elder population is usually performed in conjunction with a condition, such as cancer. Few research studies are concentrated on

the development of general nutritional interventions aimed at improving the dietary knowledge and/or dietary quality of elders. Even fewer studies look at the intergenerational relationship between grandparents and grandchildren, and their effect on nutrition and dietary behavior of the children. The following is a survey of the literature looking at nutrition interventions developed for elders. Table 2.2 has a summary of these results.

Kicklighter et al.[122] pilot tested a nutrition intervention for African American grandparents raising their grandchildren. The home-based nutrition and physical activity intervention focused on increasing the nutritional knowledge and physical activity levels of the participants. Titled "Project Healthy Grandparents Program", the intervention was modeled after "Ways to Enchance Children's Activity and Nutrition" (We Can!),[123] an intervention designed for children and their caregivers focusing on encouragement of healthy eating through promotion of low-fat, low-sugar, high-fiber foods, increasing physical activity, and reducing sedentary lifestyle. The intervention consisted of four home-based modules. The first module concentrated on nutrition and physical activity assessment and use of pedometers. The second module focused on types of foods, portion control, and how to increase physical activity. The third module was the only one conducted outside of the home. It focused on healthy shopping practices and was conducted at a grocery store. The last module focused on recipe modification. Results demonstrated that the grandparents were concerned about managing their chronic diseases and how to prevent their grandchildren from developing them. Favorite foods consisted of high-fat, traditional Southern foods, and half of the participants stated

regularly having unhealthy snacks, such as chips, candy, and cookies, in the home. Additionally, out-of-home meals weren't normally consumed, but when they were, it was fast food. The grandparents demonstrated the greatest interest in preparing healthier foods. Knowledge scores for identifying unhealthy foods, using nutrition labels, frequency of sweets consumption, ability in cooking favorite recipes in a healthier way, importance of portion control, and using one's hand for portion control improved the greatest after the intervention. Self-efficacy scores were greatest in the following items: using food labels, judging portion size, using healthier ingredients in recipes, trying new recipes, and increasing physical activity within family members. Major take away points from the study included: emphasizing small and simple changes, increasing the intensity and length of the intervention, and increasing culturally appropriate activities and modifying favorite recipes to more healthful alternatives.

Berstein et al.[124] developed an intervention aimed at increasing fruit, vegetable, and dairy consumption in community-dwelling, functionally impaired elderly. The six-month intervention included 70 participants who were randomized into the nutrition education intervention or the control group receiving an exercise intervention. The nutrition intervention consisted of eight home visits, biweekly phone calls, and monthly letters. Topics covered included importance of nutrition over the lifespan, benefits of eating fruits and vegetables, importance of calcium-rich foods, importance of eating a variety of foods, serving sizes, grocery shopping tips, and nutrient rich recipes.

Table 2.2 Summary of nutrition interventions for elders

Reference	Population	Sample Size	Intervention	Duration	Outcome
Kicklighter et al., 2009[122]	African American grandparents raising their grandchildren	5	4 modules: nutrition and physical activity, foods and portion control, healthy shopping practices, and recipe modification	-	Grandparents' concerns regarding their chronic diseses were motivators in behavioral change for preventing health problems in their grandchildren. Post intervention, participants scored higher on nutrition and physical activity knowledge, improved self-efficacy. Health status indicators remained unchanged. Self-reported changes included walking more, reading food labels, and using an alternative healthier type of fat.
Bernstein et al., 2002[124]	Men and women older than 69 years	70 (38 intervention, 32 control)	8 home visits, biweekly phone calls, and monthly newsletters, emphasizing intake of fruits, vegetables, and dairys. Exercise group received 6 months of home-based exercise program to improve strength and balance.	6 months	Participants in the nutrition group increased consumption of fruits, vegetables, and milk/dairy servings per day. Increased dietary intake of α-carotene and β-carotene were reflected in blood concentrations.
Hersey et al., 2015[125]	Low-income older adults aged 60-to-80	614	4, 45-min lessons with 20 minutes for exercise, take home activities	4 weeks	Intervention participants significantly increased average daily consumption of fruit and vegetables.
Kicklighter et al., 2007[126]	African American grandparents raising their grandchildren	22	10, 15-min nutrition and physical activity lessons	5 months	Participants had a significant increase in nutritional knowledge. Three major influences on healthful eating determined through focus groups: money, grandchildren at home, traditional food preference

Table 2.2 Continued

Reference	Population	Sample Size	Intervention	Duration	Outcome
Ellis et al., 2005[127]	Adults 59 years or older living in senior centers in northern Georgia	84	5 lessons emphasizing whole grain food identification, benefits of whole grain consumption, optimal frequency of consumption	5 to 6 months	Intervention participants were signficantly more likely to correctly identify whole grain foods. Participants reported a significant increase in consumption of whole grain bread, cereal, and crackers. Though intake increased, intake of whole grains was still low among participants.
Burke et al., 2013[128]	60 to 70 year olds in Australia	248	Program booklet providing information on how to increase physical activity and improve diet. Exercise chart and calendar. Exercise bands and pedometers were provided.	6 months	Participants reported a significant increase in physical activity and improvement in diet. Participants felt the intervention was age-appropriate, encouraging, and provided support for physical activity and dietary change. Majority of participants used pedometers and recorded daily steps.

Goal setting, rewards, food logging, and troubleshooting were all included in the home visits. The exercise group, also known as the control group, received a six-month home-based exercise intervention, focusing on improving strength and balance. The group received no nutritional information. Participants in the nutrition intervention group demonstrated an increase in fruit, vegetable, and dairy product consumption. The increased intake of targeted foods also increased consumption of α- and β- carotenes, which was reflected in increased blood levels of said metabolites. A trend in increasing body weight was found in the nutrition education group, while a trend in weight loss was found in the exercise intervention group. The study demonstrated that it is possible to increase consumption of fruits, vegetables, and calcium-rich foods in community dwelling elders. Successful interventions should include and specific and individualized approach and should reinforce record keeping and continuous monitoring.

The Eat Smart, Live Strong (ESLS) program was implemented by Hersey et al.[125] with a population of 60-to-80 year olds who are Supplemental Nutrition Assistant Program (SNAP) participants. The study was conduced with 17 intervention and 16 comparison control centers throughout Michigan. The intervention consisted of four 45-minute lessons discussion the following topics: recommended fruit and vegetable intake throughout the lifestyle, how to increase fruit and vegetable consumption and physical activity, how to modify recipes to make them healthier and incorporate more fruits and vegetables, and identifying food resources and community program for older adults. Each session began and ended with ten minutes of exercise. Additionally, participants received take-home material that included goal-setting exercises, physical activity handouts, recipe cards, participant feedback sheets, and facts sheets about the lesson messages. The program demonstrated significant effects on intervention participants. Average daily fruit and vegetable consumption increased significantly in participants. Intervention participants were also significantly more likely to talk to their doctors about fruits and vegetables they shouldn't eat, as well as talk with family and friends about how to increase fruit and vegetable consumption.

Kicklighter et al.[126] conducted another study also looking at African Americans who were primary caregivers for their grandchildren. The intervention used the Project Healthy Grandparents program and implemented it during the first 15 minutes of 10 grandparent support groups and parenting classes. The intervention was based on the We Can![123] Curriculum. The intervention was effective at significantly increasing nutritional knowledge of the participants. Focus group data resulted in the emergence of three major

themes influencing dietary behavior. The themes were the cost of healthful eating, presence of grandchildren in the home, and preference for cultural recipes and foods. Participants indicated they liked learning about inexpensive ways to perform physical activities around the home and neighborhood. Others indicated they tried to increase fruit and vegetable consumption, however, the increased cost was a big barrier to continuing the behavior. The presence of grandchildren in the home was also identified as a major barrier as grandparents feel they have to take the grandchildren's food preference into consideration. Motivation to change rose from concerns about personal health, ability to care for the grandchildren in the future, and possible onset of disease in their grandchildren. Preference for traditional foods was the third barrier to behavioral change. Participants felt they were restricted and the food they should eat wouldn't have much flavor.

Whole grain consumption was the focus of the Whole Grains and Your Health Program implemented by Ellis et al.[127] The intervention included participants aged 59 or older living in senior centers in northern Georgia. The intervention included five lessons targeting the following topics: identification of whole grain, protective qualities of whole grain consumption, and optimal amount of servings to consume. Each lesson included handouts discussing tips on how to incorporate more whole grains in the daily diet. After the intervention, consumption of whole grains significantly increased, particularly for whole grain cereal, bread, and whole-wheat crackers. However, there was no significant increase in the amount of servings of whole grains consumed in a day. Participants

demonstrated a significant increase in the ability to identify whole grain foods correctly at the post-test.

Burke et al.[128] created an intervention looking at insufficiently active 60-to-70 year olds in Australia. The Physical Activity and Nutrition Program for Seniors (PANS) was a six-month intervention aiming to improve physical activity and nutrition behavior through a home-based program. The intervention consisted of the production of a booklet, which contained the information designed to motivate and encourage participants to increase their physical activity levels, as well as improve their diet. Participants also received written material, including an exercise chart and a calendar aimed at reinforcing nutritional messages. Exercise bands and pedometers were provided to the participants. Participants reported that the exercises were clearly illustrated in the booklet and were easy to follow. Use of the pedometer was high and functioned as a motivational factor to increase physical activity. Use of the resistance bands was not as high and participants suggested some practice and trainings on how to properly use them. The booklet was well received, however suggestions for improvement included: recipes for two, how to incorporate legumes, including a section on staying mentally active, providing lactose-free options in recipes, and reducing the size of the booklet to fit in handbags.

Conclusion

The prevalence of overweight and obesity in children and adolescents continues to be cause for concern.[129] Obesity during childhood is known to have significant effects

on the health of the child throughout their childhood and into adulthood. Consequences of obesity can be physical (i.e. metabolic syndrome, sleep apnea, orthopedic complications, etc.)[130,131] and psychosocial (i.e. discrimination, targets of bullying, etc.).[132] Treatment of childhood obesity is pertinent to the future health of the general population, however the number of approaches for interventions varies greatly.[133] Knowledge alone has been shown to not be effective in initiating and maintaining dietary change.[34,35] Furthermore, we understand that family meal frequency[87-89] and self-efficacy[79,80] play significant roles in dietary choices of both adults and children.

The survey of the literature has produced a number of interventions measuring family meal frequency and/or cooking self-efficacy in children. Though the interventions were different, a number of take-away points can be assessed. Effective interventions have a "hands-on" component where the children are able to obtain the information through practice. This, coupled with introducing the information in a fun, age-appropriate manner, and teaching the children how to set and reach goals, are necessary components for positive outcomes. Additionally, incorporating the parents or guardians in the activities of the intervention, either directly or indirectly, provides further appreciation for the importance of the lessons and sets up for sustainability of skills, knowledge, and practices learned.

The survey of the literature for nutrition interventions for elders identified only few articles. However, key concepts identified included: the importance of exercise and proper illustration and training on how to accurately and safely perform them; money and how to consume a healthy diet on a budget; grandchildren and how to involve them in the

understanding of the importance of nutrition, physical activity, and the impact on future health; and culturally relevant recipes and how to create healthy recipes that are palatable and how to introduce them to the family.

Though the literature is extensive on nutrition education, its effects, and effective interventions, no article was discovered that had an intervention focused on increasing family meal frequency and cooking self-efficacy of intergenerational participants comprised of grandparent-grandchild pairings. Additionally, research on the transferability of cooking skills from grandparents to grandchildren, not co-residing, is lacking. Thus the proposed study aims to fill a part of this gap by implementing an intervention with grandparent-grandchild pairings and measuring the effect on family meal frequency, child cooking self-efficacy, and participant nutrition knowledge.

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CHAPTER THREE

METHODOLOGIES

Introduction

The objective of this study was to create and test the G.E.T.T. Cooking curriculum with grandparent-grandchild dyad participants and examine the effects of the curriculum on: cooking self-efficacy, nutritional knowledge, dietary behavioral changes, and family meal frequency. The specific research questions are:

5. How effective is the G.E.T.T. Cooking program at increasing cooking self-efficacy, nutritional knowledge, and participation in cooking related activities in children and older adult participants?
6. How effective is the G.E.T.T. Cooking program at modifying dietary behaviors in children and older adult participants?
7. Is the grandparent-grandchild relationship an effective medium for cooking skill and knowledge transferability?
8. What is the perception of the participants of the G.E.T.T. Cooking program? The perceptions addressed include enjoyment, understanding, engagement, and desire to participate again.

The methodologies used to test the research questions are further explored in this chapter presented in the following order: theoretical framework, research design, intervention characteristics, selection of participants, instrumentation, data collection, and data analysis.

Theoretical Framework

Social Cognitive Theory

The Social Cognitive Theory (SCT) is a theory widely used in nutrition and nutrition education. SCT was first explained by Bandura[1] and provided a number of constructs to explain how health promotion may be effective. The five major constructs of SCT are [2]:

- Knowledge: understanding the health risks associated with the current behavior, the benefits of changing said behavior, and what are the changes that need to occur.
- Self-efficacy: ones perception of their ability to make the necessary changes and thus having control over one's own health habits.
- Outcome expectations: a cost/benefit analysis of the expected outcomes, what it would "cost" to implement those changes, and what are the benefit of those changes. In other words, do the benefits of changing one's behavior outweigh the cost of making those changes?
- Goals: writing down goals and action plans to achieve those goals
- Perceived facilitators/impediments: understanding what resources are available as a support for initiating and maintaining change as well as understanding what barriers will be encountered and how to overcome them.

The interaction of these items has been demonstrated to explain the personal, behavioral, and environmental factors that are responsible for change, or lack thereof, as it pertains to

health.[3] Many health interventions do not target all constructs of the theory, and some have been successful doing so. However, every successful intervention has a major component which they target, self-efficacy.[3]

In this study, self-efficacy is a significant part of mediating behavior. Figure 3.1, adopted and modified from Bandura[2] to explain this particular study, provides a pictorial structural path of the effect of self-efficacy on intended change.

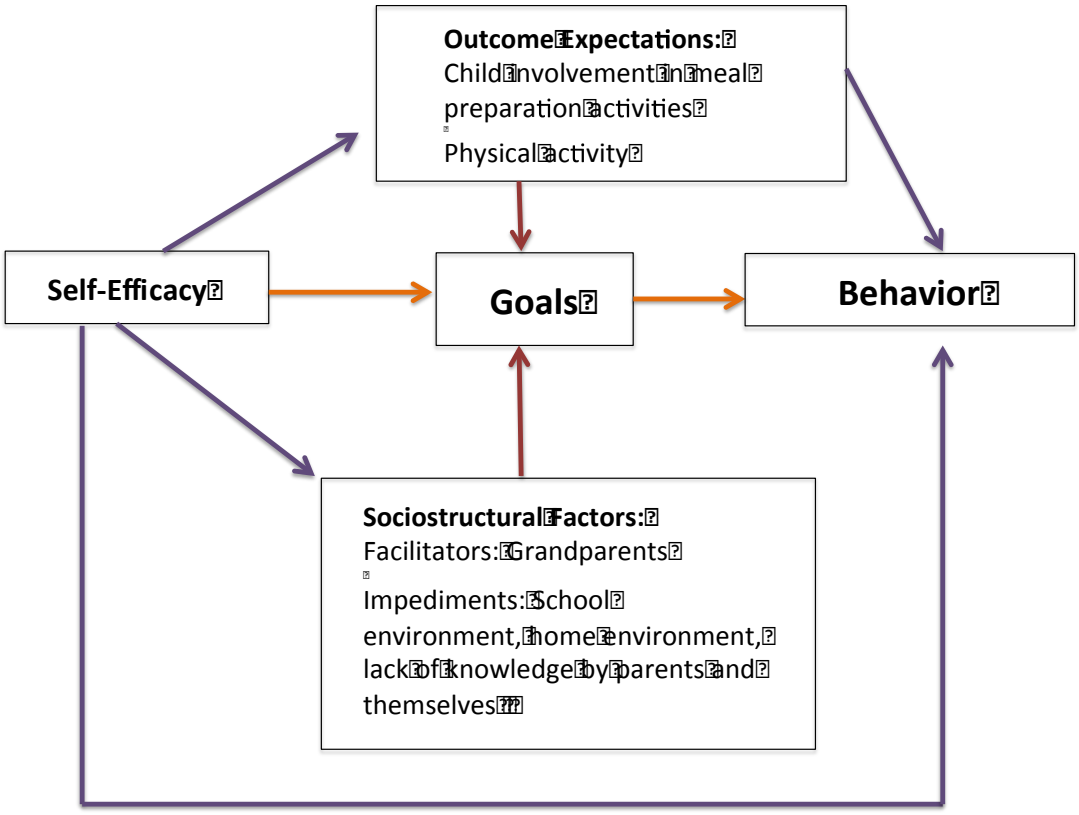

Figure 3.1 Structural path depicting how perceived self-efficacy influences behavior outcomes through goals, outcome expectations, and perceived facilitators and impediments.

Figure 3.1 demonstrates how self-efficacy is directly tied into the outcome expectations, in this case, increasing child involvement in meal preparation activities (i.e. shopping, locating items, creating meals, preparing ingredients, cleaning up) and increasing physical activity. It is also directly tied into sociostructural factors comprised of the facilitators and impediments the participants face. The facilitators in this study are the grandparents as they are encouraging their grandchildren to change through "practicing what they preach" and participating in the cooking class with them. Impediments can be the school environment and home environment. Due to the demographic of the families participating, money would not be an impediment. However, lack of knowledge of healthful dietary practices, by them and their parents, would also be an impediment.

Self-efficacy, outcome expectations, and sociostructural factors all influence the goals. In this study, the goals were broken down into eight distinct and simple tasks that were already discussed in the Intervention section of this chapter. These goals must be realistic and take into consideration the three items discussed in the previous paragraph in order for change to occur. All of these items impact behavior, thus addressing self-efficacy in particular has a significant effect on behavioral change.

Research Design

A mixed-methods quasi-experimental research design was used to test the changes in cooking self-efficacy, nutritional knowledge, dietary behavior, and family meal frequency in families participating in the G.E.T.T. Cooking program. For this paper,

a “family” is defined as a grandparent-grandchild pairing. A pre-test survey was administered one day before the first lesson. The intervention went on for four consecutive days and culminated with a post-survey. Detailed descriptions of the surveys are provided below. At the completion of each lesson, a brief five minute, recorded “question and answer” session occurred while the families consumed the meals they prepared. A 10-minute interview was conducted with the families after completion of the survey. A two-month phone interview follow-up was conducted with the participants and the parents of the children. All parties were interviewed individually. A detailed description of the qualitative data is provided below.

Intervention

The G.E.T.T. Cooking program is a comprehensive cooking curriculum heavily based on hands-on activities and familial intergenerational relationships. The curriculum is comprised of four lessons, each with a duration of 90-minutes. A breakdown of the lessons and their objectives is provided in Table 3.1.

The development of the G.E.T.T. Cooking program was a two year process. After conducting a thorough literature review of successful intervention programs, the lead researcher generated a list of eight lessons aimed at increasing nutritional knowledge, cooking knowledge and skill, food safety knowledge and practices, and resource management. Activities and games were created to disseminate the information to a young audience. Additionally, recipes were created to emphasize growth in cooking skills and food safety practices.

Table 3.1 G.E.T.T. Cooking Lesson Objectives and Targets

Lesson	Title	Objective	Intervention Target
1	MyPlate and Healthy Diets	Introduce MyPlate and address importance of consuming a healthy diet, including fresh fruits and vegetables, water, and physical activity	Increase knowledge and use of MyPlate; increase consumption of fruits and vegetables at meals; increase knowledge of obesity related diseases; increase child cooking skills
2	Meal Preparation and Food Safety	Introduce and discuss food safety, how to create recipes, meal planning, and shopping on a budget (with grandparents only)	Increase food safety practices; increase recipe creation and preparation; increase child involvement; increase money budgeting; increase child cooking skills
3	Portion Control and Kids in the Kitchen	Emphasis on how to get kids involved in all aspects of meal preparation; how to deal with picky eaters; portion control; reading nutritional labels	Increase portion control; increase consumption of novel foods by children; increase participation of children in meal prep; increase child cooking skills
4	Food Swaps, Eating Out, Exercise, and Dining Together	Demonstrate simple food swaps for healthier eating; smart tips for eating out; importance of exercise; importance of family meals	Increase family meal frequency; decrease out-of-home meals; increase physical activity

The lessons, activities, recipes, and preliminary evaluation forms were first tested with five foster families residing at the Thornwell Home for Children in Clinton, SC. Each family had between eight and 12 foster children, two foster parents, and at least two biological children from the foster parents. Each foster home had children of similar ages, with ages ranging from three-to-five year olds in one home to 15-to-18 year olds in another home. Completion of the program resulted in modification of the lessons, activities, recipes, and evaluation forms for age-appropriate audiences.

The second round of pilot testing was completed with a low-income population in Easley, SC. Two families comprised of grandparents and grandchildren participated in the eight-lesson curriculum. New recipes and activities were tested, along with the ones modified from the first round of testing. Completion of the program led to a reduction in the number of lessons, different structuring of the lessons, inclusion of new recipes, inclusion of new activities, and production of a more robust and comprehensive evaluation form.

The final stage of piloting was completed with a group of six women over the age of 50. The purpose of this stage of testing was to identify any health concerns, dietary restrictions, physical impediments to cooking or physical activity, knowledge, cooking frequency, and dietary habits of older participants. Completion of the program led to development of age-appropriate information, specifically for those over 50 years of age, concentration on nutritional information and physical activity for those over 50 years of age, inclusion of other more ethnically diverse recipes, and provided opportunities for

identification of potential participants for the pilot study of the G.E.T.T. Cooking program. The final version of the program is described in more detail below.

Each lesson started with separation of the grandparents and grandchildren. The grandchildren completed activities, games, and activity sheets with a trained undergraduate student from Clemson University. The hands-on activities were used as an interactive medium for which to provide the educational aspect of the lessons. Activities, games, and activity sheets were either created by the lead researcher or were selected from existing, publically available, nutrition interventions and governmental websites. Table 3.2 provides a breakdown of what activity sheets were obtained and the source they came from. The grandparents were in a separate room with the lead researcher participating in a discussion covering the same material as the grandchildren in an age- and experience-appropriate conversation. A large poster with main talking points was used as an aid in every lesson with the grandparents. The researcher leading the child activities was trained by the lead researcher on what and how to disseminate the information to the children and how to execute the activities. They also had a script to follow identifying the talking points and sequence of activities. The conversation and hands-on activities section had a duration of 30 minutes. A script was not used for the adult participation as participants demonstrated varying interests in different subjects. Due to the nature of the conversation, questions and points of concern were entertained, however, all information was disseminated to all participants. Upon completion of this, the families came together in the demonstration kitchen.

The second part of the lesson was comprised of cooking meals together. The grandparents and grandchildren were provided with an array of culturally diverse recipes, created by the lead researcher, throughout the four lessons. The researcher facilitated and guided the cooking activities, demonstrating techniques to both the grandparents and grandchildren, and explaining how to involve the grandkids in every step. The grandchildren were responsible for locating the ingredients throughout the kitchen and for putting ingredients away in the appropriate place. This emphasized the lessons discussing food safety and participating in food preparation responsibilities. Each lesson ended with a family meal, where the family sat together and enjoyed the meal they had prepared. The conversations that occurred during the mealtime were recorded. Questions were asked regarding what was learned throughout that lesson, what foods were prepared, what new skills were learned, what skills were practiced, what they thought of the food, and how they would be able to prepare those meals back at home. Throughout the cooking part of the lesson, as well as at the completion of the consumption of the meal, the grandchildren were responsible in helping with the cleanup and washing of dishes. This also emphasized all of the responsibilities associated with meal preparation.

At the completion of the curriculum, families participated in a "graduation" from the program. Each family received a toolkit which contained: a laminated certificate of completion, an apron with the G.E.T.T. Cooking logo, and a basket that contained a knife with a protective sheath, measuring cups, measuring spoons, two cutting boards, spices used in the recipes (i.e. chili powder, paprika, cumin, curry powder, Chinese five-spice, and dried Italian seasoning), and a laminated weekly goal sheet. The listed goals are the

Table 3.2 G.E.T.T. Cooking Activities and Source

Lesson	Activity/Handout	Source	URL
1	Move to the Beat	Children's Museum of Manhattan	http://www.eatplaygrow.org/images/uploads/downloads_20140131180424.pdf
	Benefits to Physical Activity and Family Goals	Children's Museum of Manhattan	http://www.eatplaygrow.org/images/uploads/downloads_20140131180424.pdf
	Crack the Secret Code	USDA	http://www.choosemyplate.gov/sites/default/files/audiences/SecretCode.pdf
	Have Fun with Fruits and Vegetables	USDA	http://www.choosemyplate.gov/sites/default/files/audiences/HaveFunWordSearch.pdf
	MyPlate	USDA	http://www.fns.usda.gov/sites/default/files/gd_lesson4_0.pdf
2	Stay Healthy: Wash Your Hands	USDA	http://www.fns.usda.gov/sites/default/files/gd_lesson1_0.pdf
	When in Doubt, Throw it Out!	FoodSafety	foodsafety.gov
	Chill!	FoodSafety	foodsafety.gov
	Separate!	FoodSafety	foodsafety.gov
3	Parts of the Plant	USDA	http://www.fns.usda.gov/sites/default/files/gd_lesson1_0.pdf
	Nutrition Facts Label	FDA	www.fda.gov/nutritioneducation
	Hand Guide to Portion Control	Guard Your Health	http://www.guardyourhealth.com/health-topics/nutrition/portion-size-guide/

following:

- I ate at least one vegetable today.
- I ate at least one fruit today.
- I ate at least one serving of dairy today.
- I helped prepare today's meal.
- I helped clean the kitchen.
- I helped plan today's meal.
- I drank water today.
- I did at least 60 minutes of physical activity today.

The full document can be found in the Appendix titled "Goal Sheet".

Selection of Participants

The target population for the study is comprised of older adults, defined as 50 years of age or older, whom have access to their grandchildren, aged six years or older, a minimum of twice per year. No exclusions for race, ethnicity, gender, or socioeconomic status were made. Older participants, hereafter referred to as grandparents, younger than 50 were excluded as their grandchildren would typically not be old enough to participate and commonly lack the experience and knowledge sought after by the researchers in the grandparent population of interest. Likewise, grandchildren younger than six years of age were excluded as it would be difficult for them to participate in the cooking aspects of the intervention.

Grandparents were recruited from two major locations: members of the Osher Lifelong Learning Institute (OLLI) at Clemson University in Clemson, SC and patrons of the Patrick Square Farmer's Market located in Clemson, SC. OLLI is a membership organization that focuses on providing educational classes, recreational activities, and group adventures to older members of the Clemson community. Once per week, OLLI, in joint collaboration with Clemson Downs, a local retirement community, host a farmer's market which many community members frequent. A booth was set up on five consecutive Friday's, from May to June 2015, to recruit members of the community for participation in the study.

Interested grandparents were pre-screened by the following questions:

- "How often do you see your grandchildren in a typical year?"
- "Are you over the age of 50?"
- "Will you be spending time with your grandchildren this summer for four consecutive days or more?"
- "Are you interested in participating in a cooking class with your grandchildren where you are able to teach them about cooking, facilitated by an instructor?"

Upon completion of the pre-screen, grandparents were invited to participate in the study and pick four consecutive days that would fit into their family's schedule throughout the months of July and August 2015. A convenience sample comprising of six families was obtained.

A total of six grandparents and 10 grandchildren participated in the study. The demographic information is provided in Table 3.3. All participants were white. All

grandparents were prescreened to be 50 years of age or older, thus an actual age was not collected. The average age of the grandchildren was 9.3 ± 2.21 years. All of the grandparents were female, while 80% of the grandchildren were female. Two-thirds of the grandparents have an education from a four-year institution or higher, while one-third have an education from a two-year institution or less. The majority of the grandparents, 83.3%, have an income higher than $50,000 per year.

Instrumentation

Self-Efficacy

The survey developed to test the research questions was comprised from previously validated survey instruments. The following is a description of those tools.

Cooking self-efficacy is one of the major components being measured through the survey. Numerous validated tools have been created that address cooking self-efficacy and its impact on dietary behavior. A study conducted by Hartmann[4] assessed cooking self-efficacy in two ways. First, cooking skills questions were addressed by the following seven questions: I consider my cooking skills as sufficient; I am able to prepare a hot meal without a recipe; I am able to prepare gratin; I am able to prepare soup; I am able to prepare sauce; I am able to bake cake; I am able to bake bread. These questions were based on a combination of previously validated cooking skills scales.[5,6] This cooking scale addresses cooking skills of varying degrees of difficulty directly.

Table 3.3 Demographic Information of Participants

Demographic	Grandparents	Grandchildren
Race	%	%
White	100	100
Age	-	**Yrs**
Average	-	9.3
St Dev	-	2.21
Gender	**%**	**%**
Female	100	80
Male	0	20
Educ Level	**%**	**-**
Grade 12 or GED	16.7	-
Graduated 2-Yr College	16.7	-
Graduated 4-Yr College	33.3	-
Post Graduate	33.3	-
Income	**%**	**-**
$40,001-$50,000	16.7	-
Over $50,000	83.3	-

Woodruff and Kirby[7] also developed and validated an assessment tool that addressed cooking self-efficacy in conjunction with family meal frequency, food preparation frequency, and food preparation techniques. The survey that was developed took questions from the *Project EAT,*[8] *Food Behavior Questionnaire*,[9] *Cooking with Kids*,[10] and the National Health and Nutrition Examination Survey.[11] New items

addressing cooking and nutrition education intervention were added. Food preparation frequency was addressed through questions directly asking about the involvement of the respondent in preparation of breakfast, lunch and dinner. Self-efficacy questions were assessed by the level of difficulty the respondents feel they have with a number of cooking responsibilities. These included making a meal with fruit, making a meal with vegetables, cutting up food, making a salad, and following recipe directions. Food preparation techniques were assessed through quantitative summation of the skills that respondents indicated they usually perform. Family meal was assessed by determining the frequency with which dinner was consumed with at least one guardian and by a number of questions that addressed attitudes towards family meals. The results of the study demonstrated that increased self-efficacy and high family meal attitudes and behaviors were more correlated with family dinner frequency. It was also concluded that increasing children's and adolescents' self-efficacy is an advantageous health promotion strategy. Table 3.4 provides a summary of the sources, the questions adopted, the response scale used by the research team, and the reliability test results.

For this study, two separate surveys were developed to address self-efficacy. An 11-question Likert-type survey was created for adults. The full document can be located in the Appendix 1. The questions are structured as "I feel comfortable…(performing an identified task)". Three open-ended questions were included which were "Are there any foods you feel uncomfortable preparing?", "Are there any specific dishes you would like to learn how to cook with your grandchildren?" and "Are there any specific skills you would like your grandchildren to take from the cooking class you will be

Table 3.4 Self-Efficacy Surveys Modeled with Response and Reliability Test Results

Source	Question	Reliability	Scale
Hartmann 4	I consider my cooking skills as sufficient.	α=0.91	1=do not agree 6=totally agree
	I am able to prepare a hot meal without a recipe.		
	I am able to prepare gratin.		
	I am able to prepare soup.		
	I am able to prepare sauce.		
	I am able to bake cake.		
	I am able to bake bread.		
Woodruff and Kirby 7	Typically, how many days per week do you eat dinner/supper with at least 1 parent/guardian?	r=0.669, P<.001	0-2 d/wk 3-5 d/wk 6-7 d/wk
	Make a meal with fruit.	r=0.854, P<.001	1= very hard 2=hard 3=easy 4=very easy
	Make a meal with vegetables.		
	Help make a family meal.		
	Cut up food.		
	Make a salad.		
	Measure ingredients.		
	Follow recipe directions.		
	Use a recipe with help.		

participating in?" Questions not adopted from the aforementioned questionnaires were generated as a result of the pilot testing used to create the G.E.T.T. Cooking program.

The second self-efficacy survey was an age appropriate survey developed for the grandchildren. The survey starts with 12-closed ended multiple choice questions that address the relationship with their grandparents in terms of how much time they spend with the grandparents, what are some of the activities they do, enjoyment of being around the grandparents, family meal frequency with grandparents and at home, and frequency of participation in meal preparation activities at home. The second part of the survey includes 16 Likert type questions addressing self-efficacy and current dietary behaviors. The questions are also structured as "I feel comfortable…(performing an identified task)". This survey can be located in the Appendix 2.

The adult self-efficacy post survey was comprised of 10-Likert type questions formatted as the following "Due to the skills I learned in the cooking class, I now feel more comfortable…(performing the same identified tasks from the pre-survey)". Four open-ended questions were included at the end of the survey addressing their thoughts of the cooking class. This document is located in the Appendix 3.

The child self-efficacy post survey included six close-ended multiple-choice questions that addressed attitudes and behaviors surrounding cooking after the completion of the class. Family meal frequency was also assessed with a multiple-choice question. Eighteen Likert-type questions assessed self-efficacy and were formatted as "After the cooking class, I feel more comfortable…(performing the same identified tasks

from the pre-survey)". Two new items were added to the post survey to assess if there was a reduction in eating pickiness. This document is located in the Appendix 4.

EFNEP Eating Right Survey

The Expanded Food Nutrition and Education Program (EFNEP) is a governmental program aimed at helping low-income populations improve four core areas of health and nutrition: diet quality and physical activity, food resource management, food safety, and food security. The peer education model is central to EFNEP, using members from the community as liaison throughout the education process. The programs are executed through paraprofessionals and the interventions are heavily hands-on and interactive.[12]

EFNEP has created a number of assessment tools to evaluate the effectiveness of their program. One such tool is the EFNEP Eating Right Survey. This survey is the first part of a 24-hour dietary recall document. The survey is comprised of ten Likert-type questions addressing meal preparation habits, shopping practices, food safety practices, and other nutrition related practices. In addition, the survey asks about consumption of nutritional supplements, amount of money spent on food in the last month, and duration of physical activity. This survey was completed by the grandparents before the start of the cooking classes and completed over the phone by the lead researcher at the follow-up interview. This document can be located in the Appendix 5.

EFNEP has also created age-appropriate assessment tools used to evaluate the nutritional knowledge that children have regarding the food groups, physical activity, and

food safety practices. The surveys are broken down for the following age-groups K-second grades, third-to-fifth grades, sixth-to-eighth grades, and ninth-12th grades. These surveys were completed by the grandchildren for their age-appropriate level prior to the beginning of the lessons and at the completion of the program. The survey was not completed at the follow-up interview due to the nature of the interview being conducted over the phone. These documents can be located in the Appendix 6 through 9.

G.E.T.T. Cooking Questionnaire

Aside from self-efficacy, nutritional knowledge, and family meal frequency, there are a number of other items that are correlated with efficacy of a participant changing their health behaviors. Thus, the G.E.T.T. Cooking Questionnaire, created by the lead researcher, was used to include psychosocial variables, meal specific variables, and enjoyment of cooking and meal planning attitudes. Table 3.5 provides a summary of the sources, the questions adopted, the response scale used by the research team, and the reliability test results.

Psychosocial stressors, normally those associated with work, have been demonstrated to be associated with risks of obesity and metabolic syndrome. Stressors don't have to originate from a workplace, as life stressors can also cause similar issues. [13,14] A work-life balance is an important aspect of a healthy lifestyle, thus questions regarding "work" load were addressed in the survey. For this survey, the "work" load is defined by the researchers as "work outside of the normal activities completed at home,

Table 3.5 G.E.T.T. Cooking Questionnaire Surveys Modeled with Response and Reliability Test Results

Source	Question	Reliability	Scale
Hogen 17	In my family, it is often difficult to find a time when family members can sit down to a meal together. In my family, it is important that the family eat at least on meal a day together. In my familyt, we usuallye at meals at the same time every day. In my family, it has been stressed that mealtime is a time when the family should talk together. My mother usually plans and prepares the family meals.	α=0.80	1=Strongly Agree 2= Agree 3=Disagree 4=Strongly Disagree
	In my family, we eat "healthy foods" often. Eating a balanced diet is very important in my family. My family enjoys going to ethnic restaurants that are different from our ethnic background.	α=0.67	1=Strongly Agree 2= Agree 3=Disagree 4=Strongly Disagree
Hartmann 4	I think it is important to eat healthily. My health is dependent on how and what I eat. If one eats healthily, one gets ill less frequently. I am prepared to elave a lot, to eat as healthily as possible.	α=0.83	1=Do not Agree 6=Totally Agree
	Since I'm always under time pressure, I try to save time while cooking. Preferable, I spend as little time as possible on meal preparation. At home, I preferably eat meals that can be prepared quickly.	α=0.82	1=Do not Agree 6=Totally Agree
	Cooking is an important type of relaxation for me.	α=0.95	1=Do not Agree

	Preparing a meal brings joy in my life. While preparing a meal I can play out my creativity. Preparing a meal is a satisfactory activity for me.		6=Totally Agree

including volunteer positions and community work". This is important to define as the adult population whom participated in the study were all above the age of 50 and were all retired adults. Questions were created through factors identified as important psychosocial stressors from two studies[15,16] and were included in the questionnaire as Likert-type questions using a five-point scale from strongly disagree to strongly agree.

A family's use of food and their attitudes and behaviors toward foods has been well established as a mediator for the attitudes and behaviors younger family members have with food.[17] Hogen[17] created the Family Eating Attitude and Behavior Scale (FEABS) which included 60 items measuring a family's use of food. A total of eight general measures were assessed which included: external control of food intake, mealtime as the structure of family interactions, pleasure related to family meals, nutritional value of food, food as a function of mood, ethnic identity expressed through food, rules related to mealtime, and food as a reinforcer. Due to the nature of the study, several aspects of the FEABS were left out when questions were being adopted for the G.E.T.T. Cooking questionnaire. These included food as a function of mood, ethnic identity expressed through food, and food as a reinforcer. Questions were provided as five-point Likert-type questions with a response scale of strongly disagree to strongly agree.

General demographic questions were included in the questionnaire. Questions included information regarding ethnicity, work status, marital status, number of people in the household, education level, social media use, and income. Questions regarding access to food and frequency of shopping were also included. An additional set of questions regarding enjoyment of cooking and meal planning were also included in the questionnaire. The aims of the questions were to help in informing the questions adopted from the FEABS. It was hypothesized that the attitudes and behaviors towards food can, in part, be explained by feelings towards the enjoyment of cooking. These items were presented as five-point Likert-type questions with a scale from strongly disagree to strongly agree.

In its entirety, the G.E.T.T. Cooking questionnaire had a total of 48 questions (this includes questions that are part of a skip-logic) and was provided in paper format. It took an average of 15 minutes to complete the survey and only grandparents were required to respond. The questionnaire was completed prior to the beginning of the program. The full document can be located in the Appendix 10.

The post-survey is structured very similarly to the pre-survey, however, demographic questions, psychosocial variables, and many aspects of the FEABS were excluded. A total of 29 questions are included in the post-survey, the majority being comprised of five-point Likert-type questions from strongly disagree to strongly agree. Questions in the post-survey emphasize intended participation of the grandchildren in meal preparation activities, changes in dietary behaviors, changes in food purchasing practices, and changes in food safety. Two open-ended questions were included at the

end of the survey addressing the impact of the class on themselves (i.e. the grandparents) and the perceived impact of the class on their grandchildren. The survey took an average of 10 minutes to complete and was done so only by the grandparents. The document can be found in the Appendix 11.

Interviews

The qualitative data collected throughout the study presented in this dissertation was done so through interviews. Maxwell[18] defines the purpose of qualitative data as a means of providing an understanding to the experiences and responses that people provide. Oftentimes, it is used as a supplement to quantitative data that is collected, allowing for further explanation of why an outcome was observed and what those mediating factors may be.[19]

In this study, semi-structured, open-ended interview questions were created to assess and understand factors associated with sustainability, or lack thereof, of the results seen at the end of the program. The semi-structured format allowed for a consistent, yet flexible, format for which to ask questions while also providing ample opportunities to follow-up on important comments made by the participants. Three sets of questions were created: one for the grandparents, one for the grandchildren, and one for the parents of the children who participated.

Interview questions for the grandparents addressed changes in cooking habits, changes in dietary habits, changes in food safety, changes in shopping practices, changes in interactions with their grandchildren, and feedback about the program. Interview

questions for the grandchildren addressed recalling lessons learned, changes in self-efficacy, participation in meal preparation activities, family meal frequency, goal attainment, changes in dietary behaviors, assessment of the toolkit, and feedback regarding the program. The parents were also interviewed, even though they did not participate in the program. The researchers hypothesized that changes made by the children would be seen in the home and any siblings or other family members would become interested in those changes and would provide opportunities to learn from the members that participated in the program. Thus, questions to the parents assessed noticeable dietary changes, changes in participation of meal preparation activities, use of the toolkit, goal attainment, impact of cooking class on participants, impact of cooking class on other family members who did not participate, and feedback on the program. All of the interviews were conducted on the phone and were performed with each person individually. In other words, we asked the parents to allow the child to speak on the phone independently so as not to cross contaminate the data collected. None of the grandparents resided with their grandchildren thus all grandparents were interviewed individually. Each interview had an average duration of 20 minutes. The interview questions can be located in the Appendix 12.

Less formal qualitative questions were asked during the meal consumption portion of the lesson. The questions asked were the following:

- What lessons did you learn today?
- What foods did we prepare today?
- What new skills or techniques did you learn while cooking today?

- How can you use these new skills back at home?
- What do you think about the meal you prepared?

These questions were used to understand the change process the grandchildren were undergoing throughout participation in the program.

Data Collection

The study utilized a quantitative and qualitative methodology to obtain the data. Both are discussed further. Table 3.6 provides a summarized timeline of the intervention, the data collected, and the survey or method used to do so.

Table 3.6 Summary of intervention days, data collected, and method used for data collection.

Day	Quantitative Data Collected	Survey Used	Qualitative Data Collected	Qualitative Method Used
0 (pre-intervention)	Cooking Self-Efficacy	Child Self-Efficacy and Adult Self-Efficacy Pre-Surveys	-	-
	Nutrition Knowledge (Children only)	EFNEP Age-Specific Nutrition Knowledge Surveys	-	-
	Adult Food Behaviors	EFNEP Eating Right Survey	-	-

	Demographics, psychosocial variables, meal specific variables, enjoyment of cooking, meal planning attitudes	G.E.T.T. Cooking Questionnaire Pre-Survey	-	-
1 (intervention)	-	-	Information learned, new skills learned, skills practiced, and thoughts on recipes prepared	Family Meal Conversation
2 (intervention)	-	-	Information learned, new skills learned, skills practiced, and thoughts on recipes prepared	Family Meal Conversation
3 (intervention)	-	-	Information learned, new skills learned, skills practiced, and thoughts on recipes prepared	Family Meal Conversation

4 (intervention)	Cooking Self-Efficacy	Child Self-Efficacy and Adult Self-Efficacy Post-Surveys	Information learned, new skills learned, skills practiced, and thoughts on recipes for the day and for the overall program	Family Meal Conversation and Post-Intervention Interviews
	Nutrition Knowledge (Children only)	EFNEP Age-Specific Nutrition Knowledge Surveys		
	Psychosocial variables, meal specific variables, enjoyment of cooking, meal planning attitudes	G.E.T.T. Cooking Questionnaire Post-Survey		
5 (two-month follow-up)	Adult Food Behaviors	EFNEP Eating Right Survey	Assessment of toolkit, lessons learned, skills developed, most popular recipes, assessment in cooking activity participation	Follow-up phone interview with grandparents, parents, and grandchildren

Quantitative

The quantitative data was collected using several surveys discussed previously. A convenience sample of six grandparents was recruited during the months of May and

June 2015. After discussing participation in the program with the grandchildren's parents, a schedule was set up for participation. The day prior to the beginning of the class the participants, both grandparent and grandchild/grandchildren, completed the G.E.T.T. Cooking pre-survey questionnaire, adult self-efficacy pre-survey, child self-efficacy pre-survey, and EFNEP Eating Right survey. Participation occurred on the next four days after completion of the pre-intervention surveys. Upon completion of the program, the participants completed the G.E.T.T. Cooking post-survey questionnaire, adult self-efficacy post survey, and child self-efficacy post-survey. This was conducted at the end of the last lesson. During the interview, the EFNEP Eat Right survey was completed by the lead researcher and the data was included in the quantitative analysis.

Qualitative

The qualitative method of data collection incorporated recorded family meal conversations during the program, an end-of-program in-person interview, and a follow-up phone interview. The following were the steps taken to collect this data.

1. Upon completion of the meal preparation activities, the family sat down to a family style dinner. The lead researcher would turn on the recorder and proceeded to ask the family questions regarding the lessons learned that day, any new skills developed, any skills that are practice, how the children can help out at home with the new skills they learned, and comments about the recipes they prepared.
2. On the final day of the program after all of the surveys had been completed an interview with the families was performed. Questions regarding overall lessons,

self-efficacy, skills, goal attainment, participation in meal preparation activities, and use of the toolkit were discussed.

3. Telephone interviews were conducted two months after the completion of the program. Grandparents were contacted separately from the grandchildren and were asked semi-structure, open-ended questions, available in the Appendix. Parents were contacted and asked for a time when both they and their children would be able to participate in the interview, however separation was asked so as not to contaminate the data collected. Although this was not guaranteed and could not be verified by the researcher, the importance of separation between parent and child during the interview was greatly emphasized to the parent during the scheduling of the interview, as well as prior to the beginning of each interview. Questions, found in the Appendix, were asked of the children and the parents individually. Any particularly interesting or vague responses were followed up with additional questions for clarification and explanations.

Data Analysis

This study was a mixed methods study, thus data collection and analysis employed qualitative and quantitative methodologies. The data analysis is discussed further here.

Quantitative Analysis

The study design was quasi-experimental with a pre-intervention, intervention, post-intervention, and follow-up phases. The quantitative data was collected during the pre- and post-intervention phases. Descriptive statistics were used to document family meal frequency, self-efficacy, nutritional knowledge, and familial characteristics for shopping practices, dietary habits, and food access. The data were analyzed using SPSS Version 21. Comparative descriptive statistics were generated, however, due to the low number of participants, an assessment of statistical significance was not performed. Changes in responses are documented and presented as trends.

Effect size for the data was calculated through a multi-step process. First, the correlation between cooking self-efficacy scores of grandchildren and their grandparents was identified for the pre- and post-intervention phases. The correlation coefficient, along with the number of participants, was used in an effect size calculator to determine a confidence interval for the group tested. That data, combined with an estimated increased number of participants, was used to graph the 95% confidence interval. The graph demonstrated that at increasing intervals of participants, the degree of change in the confidence interval decreased substantially, until an ideal effect size was identified. Results are provided in Chapter 4.

Qualitative Analysis

The qualitative analysis consisted of screening the qualitative data for similarities and differences between families, coding and categorization of emerging themes, and constant comparisons between responses provided by different families and the SCT

constructs. All interviews were recorded, transcribed, and analyzed for similarities and differences using NVIVO 9.0. Special attention was paid to responses that discussed self-efficacy, hurdles or facilitators to outcomes, goal attainment, and action plans. These topics formed the categories for which the data was coded. Emerging themes from the data were compared to the research questions. Additionally, emerging themes were compared to the literature on SCT.

Triangulation of the data, used to validate the qualitative data collected,[20] was performed. Data triangulation was performed by interviewing the grandparents, grandchildren, and parents. The data were analyzed for similar themes regarding changes in self-efficacy of the grandchildren and sustainability of any results seen.

Summary

This chapter discussed the methodologies employed by the researchers to collect and analyze the data. Participants were recruited through a convenience sample from OLLI and patrons of the Patrick Square Farmer's Market, resulting in six participating families comprised of one grandparent and one or two grandchildren. A detailed description of the G.E.T.T. Cooking program was provided and target outcomes were discussed. The theoretical framework for the study and instrument development was provided, emphasizing the Social Cognitive Theory. Discussions regarding the methodologies for the quantitative and qualitative data collection and analysis were provided in detail. Results of the data analysis are provided in the next two chapters.

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CHAPTER FOUR

THE EFFECTIVENESS OF THE G.E.T.T. COOKING CURRICULUM ON COOKING SELF-EFFICACY AND FAMILY MEAL FREQUENCY: DESCRIPTIVE ANALYSIS OF A PILOT STUDY

Introduction

Obesity continues to be a problem worldwide, with an estimated one-third of the US child and adolescent population being overweight or obese,[1] defined as above the 85th percentile in BMI for age, height, and gender.[2] Though genetics and metabolism may account for a percentage of the epidemic,[3] environmental factors, such as frequency of fast-food consumption,[4] portion sizes,[5] consumption of sugar-sweetened beverages,[6] lack of nutrition knowledge, lack of cooking skills,[7] and increasing sedentary activities[8] are thought to be the more significant variables. Childhood and adolescence is a critical time in the future health of a person as dietary patterns, sedentary behaviors, and relationships with food are established during childhood and adolescence.[9,10] Additionally the likelihood that overweight children continue to be overweight in adulthood is staggering.[11,12]

Another population struggling with their health is senior citizens. Overcome with already existing complications, many seniors don't have the knowledge, ability, or resources to feed themselves in the appropriate manner.[13-15] The nutritional status of older Americans is also of concern, specifically due to the high number suffering from diet related complications such as cardiovascular disease, hypertension, and type-2 diabetes.[16]

The researchers of this study created a hands-on, interactive, culinary curriculum aimed at increasing cooking self-efficacy, nutritional knowledge, and family meal

frequency of its participants. In this particular pilot study, the effects of this curriculum were examined in a group of intergenerational family members comprised of grandparents and grandchildren. The purpose of this study was achieved through development of a self-efficacy scale and use of an age appropriate nutritional knowledge scale. The results of the descriptive statistics, self-efficacy scale, and nutritional knowledge scale are presented in this chapter. Due to the small number of participants and the pilot study nature of this study, the researchers attempt to provide a comparison of effect sizes to illustrate the number of participants needed for a proper experimental study.

Methods

Study Setting

The study was conducted at the Cheezum Center located in Clemson, SC. The Cheezum Center is the building where classes are held for members of the Osher Lifelong Learning Institute (OLLI) at Clemson University. OLLI's members are all senior citizens who enjoy learning and participating in both indoor and outdoor activities. Some of the resources located in the Cheezum Center are art rooms and a large cooking demonstration kitchen. The art rooms were used to provide a quiet and separate place where the children participants were able to engage in the hands-on activities part of the lessons. The cooking demonstration kitchen was used to prepare the recipes. Due to the large size of the kitchen, opportunities could be provided for multiple families to participate simultaneously.

Instrumentation

The researchers used several surveys to collect the quantitative data. There were three major points for data collection: pre-intervention, post-intervention, and two-month follow-up phone interview. On the day prior to the beginning of the program, the families were gathered to fill out the pre-intervention surveys. The first survey was a self-efficacy survey. This survey was modeled from scales developed by Hartmann et al.[17] and Woodruff and Kirby.[18] Two self-efficacy surveys were generated; an 11-item Likert type questionnaire for adults and a 28-item Likert type and closed ended questionnaire for children. The adult survey also contained three open-ended questions that assessed preferences in skills and dishes participants wanted to learn. The child self-efficacy questionnaire included 12-closed ended multiple choice questions addressing the relationship with the grandparents, activities they do together, enjoyment of being around the grandparents, family meal frequency with grandparents and at home, and frequency of participation in meal preparation activities at home.

A post-intervention version of the self-efficacy survey was administered at the completion of the program. It included six close-ended multiple-choice questions that addressed attitudes and behaviors surrounding cooking after the completion of the class. Family meal frequency was also assessed with a multiple-choice question. Eighteen Likert-type questions assessed self-efficacy and were formatted as "After the cooking class, I feel more comfortable…(performing the same identified tasks from the pre-survey)". Two new items were added to the post survey to assess if there was a reduction in food pickiness.

Nutrition related home practices were assessed by the use of the Expanded Food Nutrition Education Program (EFNEP) Eating Right Survey.[19] This survey is attached to a 24-hour dietary recall. The dietary recall information was not captured, however, the Eating Right Survey provided information regarding meal preparation habits, shopping practices, and food safety practices. This survey was completed prior to the beginning of the program and by the interviewer during the follow-up interview.

EFNEP has also created age-appropriate assessment tools to evaluate nutritional knowledge of children. The age breakdowns for the assessment tools are K-second grades, third-to-fifth grades, sixth-to-eighth grades, and ninth-to-12th grades. Topics assessed included knowledge about food groups, physical activity, and food safety practices. The surveys were completed prior to the beginning of the program as well as at the end of the program.

The final survey taken by the participants was the G.E.T.T. Cooking questionnaire. This questionnaire addressed psychosocial variables, meal specific variables, and enjoyment of cooking and meal planning attitudes. Only the grandparents were required to take this survey and did so prior to the beginning of the program and at the completion of the program. Questions addressing the family's use of food and their attitudes and behaviors toward the foods were adapted and modified from the Family Eating Attitude and Behavior Scale (FEABS) created by Hogen.[20] The questions appeared as a five-point Likert-type questionnaire with responses ranging from strongly disagree to strongly agree.

Psychosocial variable questions were adapted from Marshall and Barnett [21,22] and were assessed using a five-point Likert-type questionnaire with responses ranging from strongly disagree to strongly agree. Due to the nature of the population involved in the study, work load is defined by the researchers as "work outside of the normal activities completed at home, including volunteer positions and community work".

General demographic questions were included in the questionnaire. Questions included information regarding ethnicity, work status, marital status, number of people in the household, education level, social media use, and income. Questions regarding access to food and frequency of shopping were also included. An additional set of questions regarding enjoyment of cooking and meal planning were also included in the questionnaire. The aims of the questions were to help in informing the questions adopted from the FEABS. It was hypothesized that the attitudes and behaviors towards food can, in part, be explained by feelings towards the enjoyment of cooking. These items were presented as five-point Likert-type questions with a scale from strongly disagree to strongly agree.

Recruitment

Grandparents were recruited from two major locations: members of the Osher Lifelong Learning Institute (OLLI) at Clemson University in Clemson, SC and patrons of the Patrick Square Farmer's Market located in Clemson, SC. OLLI is a membership organization that focuses on providing educational classes, recreational activities, and group adventures to older members of the Clemson community. Once per week, OLLI, in

joint collaboration with Clemson Downs, a local retirement community, hosts a farmer's market which many community members frequent. A booth was set up on five consecutive Friday's, from May to June 2015,to recruit members of the community for participation in the study.

Interested grandparents were pre-screened by the following questions:

- "How often do you see your grandchildren in a typical year?"
- "Are you over the age of 50?"
- "Will you be spending time with your grandchildren this summer for four consecutive days or more?"
- "Are you interested in participating in a cooking class with your grandchildren where you are able to teach them about cooking, facilitated by an instructor?"

Upon completion of the pre-screen, grandparents were invited to participate in the study and pick four consecutive days that would fit into their family's schedule throughout the months of July and August 2015. A convenience sample comprised of six families was obtained.

Data Analysis

The analysis consisted of two major phases. The first was the descriptive data generated through the use of SPSS Version 21. Due to the small sample size, statistical comparisons were not performed. However, the data are presented as numerical changes in self-efficacy, family meal frequency, and nutritional knowledge. The self-efficacy items were addressed on a Likert-type scale. This allowed for the generation of a self-

efficacy value, which was summed and provided a self-efficacy value out of a total number of points. The values are presented as numbers and percentages. This allows for comparison of self-efficacy values among individuals.

The second part of the analysis was estimating effect size. The purpose of estimating the effect size was to determine the ideal number of participants required to identify statistically significant changes within the participants, as well as determining an appropriate number of participants required to confidently capture the means of the intended variables within the population of interest. A plot was generated comparing the self-efficacy values of the grandparents vs. grandchildren and a correlation was derived. This was done for the pre- and post-intervention self-efficacy scores. Effect size for weak, medium, and strong correlations were derived.

Results

Cooking Self-Efficacy

The adult self-efficacy questionnaire asked questions regarding the comfort level of performing certain tasks and preparing recipes of varying degrees of difficulty. All questions were asked on a five-point Likert-type scale. Self-efficacy scores were totaled for each individual and presented as a percentage out of the maximum amount of points allowed. The average pre-intervention adult self-efficacy scores was 47.83 ± 5.74. The average post-intervention adult self-efficacy score was 44.5 ± 7.23. The maximum self-

efficacy score was 50. Figure 4.1 is a graph of the self-efficacy scores pre- and post-intervention for all of the grandparents. All of the participants, with the exception of one, had a higher post-intervention self-efficacy score compared to the pre-intervention score. Though this may seam counterintuitive, the decrease in self-efficacy of score of the one participant was significant enough to reduce the overall average of the post-intervention

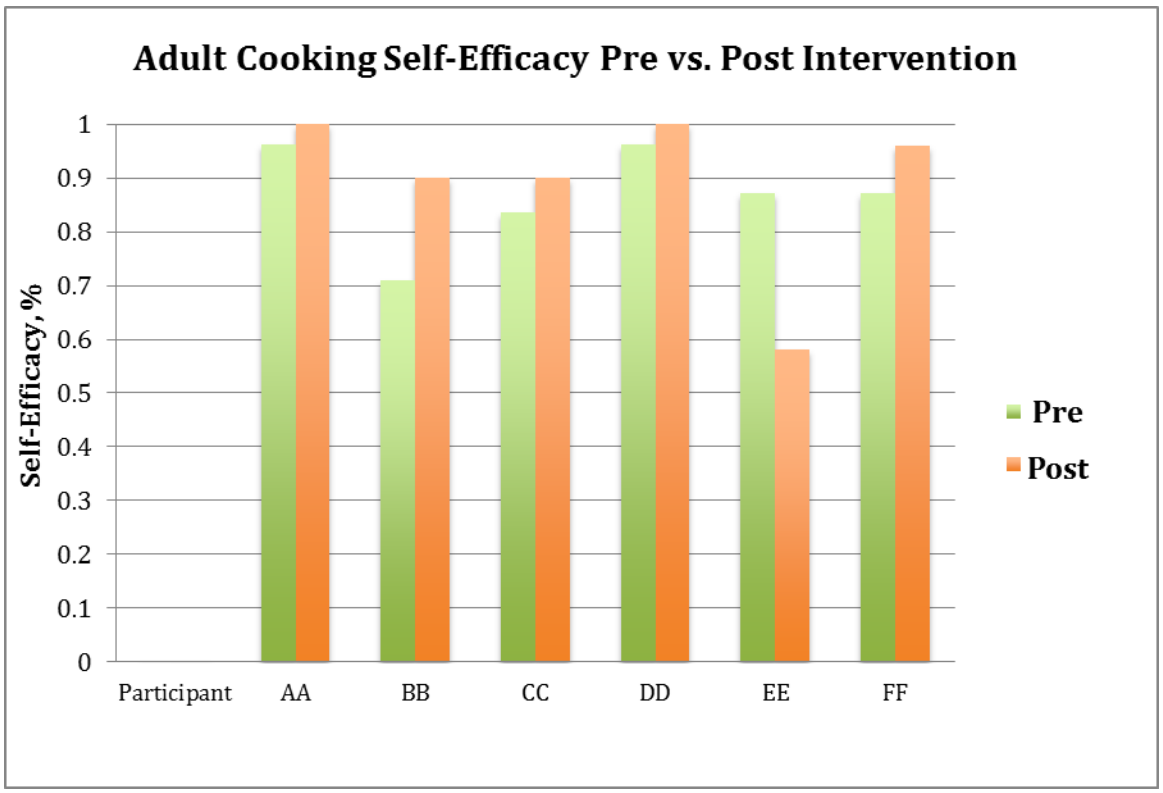

Figure 4.1 Comparison of pre- and post- intervention cooking self-efficacy percentage scores for grandparent participants.

self-efficacy score. However, on an individual basis, five out of the six participants had an increase in self-efficacy scores from pre-to-post intervention phases.

Table 4.1 provides a summarized output of the questions and the frequency of responses at the pre- and post-intervention phases. The questions can be viewed in their entirety by referencing Appendix 1 for the pre-intervention self-efficacy questions and Appendix 3 for the post-intervention self-efficacy questions.

Table 4.1 Adult Self-Efficacy Response Frequencies for Pre- vs. Post-Intervention

	Frequency of Responses				
Question	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
Baked Chicken					
Pre	-	-	-	16.70%	83.30%
Post	16.70%	-	-	16.70%	66.60%
Casserole					
Pre	-	-	-	16.70%	83.30%
Post	16.70%	-	-	16.70%	66.60%
Lasagna					
Pre	-	-	-	16.70%	83.30%
Post	16.70%	-	-	16.70%	66.60%
Beef Wellington					
Pre	-	16.70%	33.30%	33.30%	16.70%
Post	16.70%	-	16.70%	33.30%	33.30%
Fish and Shellfish					
Pre	16.70%	16.70%	-	16.60%	50.00%
Post	-	-	16.70%	-	83.30%
Poultry					
Pre	-	-	-	33.30%	66.70%
Post	16.70%	-	-	16.70%	66.60%
Meat Dishes					
Pre	-	-	-	33.30%	66.70%
Post	-	-	-	16.70%	83.30%

Herbs & Spices					
Pre	-	-	-	83.30%	16.70%
Post	-	-	-	-	100.00%
Dishes from Other Cultural Background					
Pre	-	33.30%	33.30%	16.70%	16.70%
Post	-	-	-	16.70%	83.30%
Learn More Herbs & Spices					
Pre	-	-	-	16.70%	83.30%
Learn More Other Cultural Dishes					
Pre	-	-	-	33.30%	66.70%
More Comfortable Other Cultrual Dishes					
Post	-	-	-	16.70%	83.30%

Techniques such as preparing baked chicken, casseroles, and lasagna, had a high pre-intervention self-efficacy, with 83.3% of the participants selecting they "strongly agree" to the statement of comfort with preparing said dishes. More difficult dishes, such as beef wellington and seafood, had a lower pre-intervention self-efficacy, with 50% and 66% of participants selecting "agree" or "strongly agree" for comfort preparing those dishes, respectively. However, participants felt that participating in the cooking class provided them with skills necessary to successfully prepare dishes such as beef

wellington and seafood. Though all participants selected they already use herbs and spices when cooking, and 83% selected wanting to learn more about using herbs and spices, 100% of the participants strongly agreed that the class made them more comfortable using herbs and spices in their cooking. Likewise, participants agreed to wanting to learn how to prepare dishes outside of their cultural background and many didn't prepare culturally different dishes, however after the class, participants strongly agreed that they felt more comfortable preparing and seeking out recipes outside of their cultural background.

The child self-efficacy questionnaire also asked questions regarding comfort level with performing cooking tasks. All questions included in the self-efficacy score were on a five-point Likert-type scale. The maximum score for the pre- and post- intervention surveys were 80 and 90, respectively. The average pre-intervention child self-efficacy score was 62.2 ± 13.17. The average post-intervention child self-efficacy score was 76.7 ± 13.08. Figure 4.2 illustrates the individual percentage scores for each child for both the pre- and post-intervention phases. One child had a lower post-intervention self-efficacy score, however, they started off with a pre-intervention score above 85%. Another child had a very low pre-and-post intervention self-efficacy score but was also the youngest of all the participants, at six years of age.

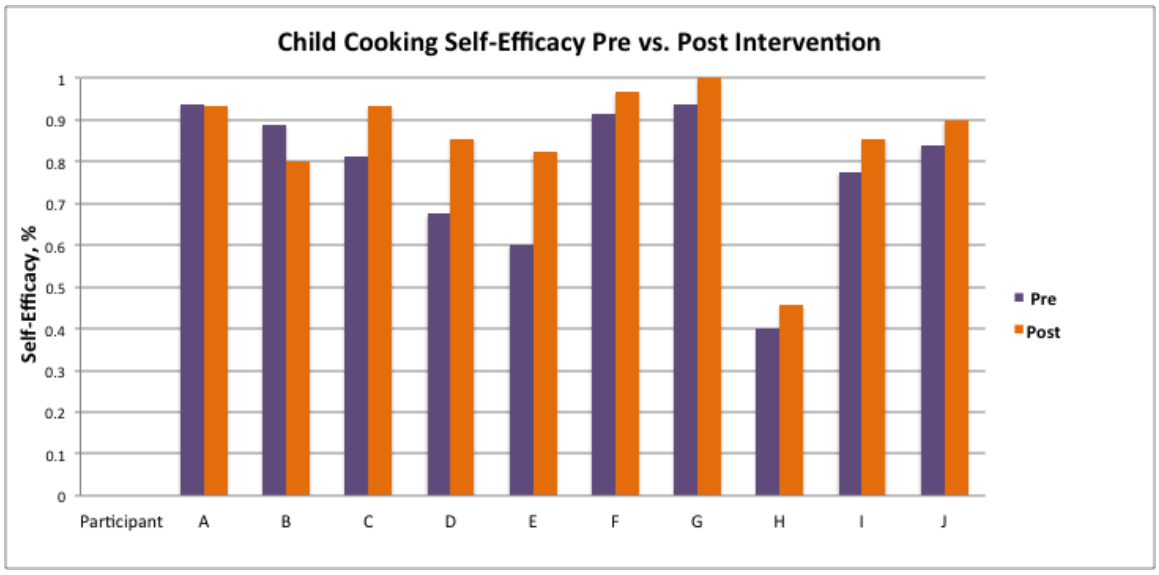

Figure 4.2 Comparison of pre- and post-intervention cooking self-efficacy percentage scores for children participants.

Table 4.2 provides a summarized output of the questions and the frequency of responses at the pre- and post-intervention phases. The questions can be viewed in their entirety by referencing Appendix 2 for the pre-intervention self-efficacy questions and Appendix 4 for the post-intervention self-efficacy questions.

Table 4.2 Child Self-Efficacy Response Frequencies Pre- vs. Post-Intervention

	Frequency of Responses				
Question	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
Peeling Fruits & Vegetables					
Pre	10.00%	10.00%	-	40.00%	40.00%
Post	10.00%	-	-	20.00%	70.00%

Cutting Fruits & Vegetables					
Pre	10.00%	-	10.00%	20.00%	60.00%
Post	10.00%	-	-	20.00%	70.00%
Touching Raw Meat					
Pre	20.00%	20.00%	10.00%	30.00%	20.00%
Post	10.00%	-	10.00%	40.00%	40.00%
Touching Cooked Meat					
Pre	-	10.00%	-	20.00%	70.00%
Post	-	-	10.00%	20.00%	70.00%
Touching Raw Fish					
Pre	20.00%	10.00%	10.00%	30.00%	30.00%
Post	10.00%	20.00%	-	30.00%	40.00%
Touching Cooked Fish					
Pre	20.00%	-	-	30.00%	50.00%
Post	-	10.00%	10.00%	10.00%	70.00%
Green Salad on Own					
Pre	10.00%	10.00%	-	10.00%	70.00%
Post	10.00%	-	-	20.00%	70.00%
Cooking Meats					
Pre	10.00%	-	20.00%	20.00%	50.00%
Post	-	-	10.00%	30.00%	60.00%
Using Knives					
Pre	10.00%	10.00%	10.00%	20.00%	50.00%
Post	-	10.00%	-	30.00%	60.00%
Boiling Water					
Pre	10.00%	10.00%	-	30.00%	50.00%
Post	10.00%	10.00%	10.00%	20.00%	50.00%
Helping Parents Cook					
Pre	-	-	50.00%	30.00%	20.00%
Post	-	10.00%	-	20.00%	70.00%

Want to Help More					
Pre	10.00%	-	10.00%	50.00%	30.00%
Post	10.00%	-	-	30.00%	60.00%
Help Make Choices for Dinner					
Pre	10.00%	-	40.00%	40.00%	10.00%
Post	10.00%	-	10.00%	40.00%	40.00%
Help Pick Out Groceries					
Pre	10.00%	-	30.00%	20.00%	40.00%
Post	10.00%	-	-	50.00%	40.00%
Like to Eat Vegetables					
Pre	10.00%	10.00%	20.00%	40.00%	20.00%
Post	10.00%	10.00%	10.00%	20.00%	50.00%
Like to Eat Fruit					
Pre	-	-	-	30.00%	70.00%
Post	-	-	-	40.00%	60.00%

Comfort in peeling and cutting fruits and vegetables during the pre-intervention phase was high with 80% of participants selecting “Agree” or “Strongly Agree”. At the post-intervention phase, 80% of participants selected “Agree” or “Strongly Agree”, however the shift from pre- to post-intervention scores for “Strongly Agree” went from 40% to 60%. Fifty percent of the participants felt comfortable with touching raw meats like chicken and pork in the pre-intervention phase, however, that value increased to 80% by the end of the program. The frequency of comfort in touching cooked meats like chicken and pork remained the same. Comfort with handling raw fish was distributed across the board, with 60% selecting “Agree” or higher at the pre-intervention phase. By the end of

the program, 70% selected “Agree” or higher. Comfort in touching cooked fish remained the same at 80% selecting “Agree” or higher, however, the frequency changed from to 50% to 70% for “Strongly Agree”. Comfort in making a green salad on their own changed from 80% to 90% selection of “Agree” or higher from the pre- to post-intervention phases. Comfort in cooking meats like chicken and pork increased from 70% to 90% selecting “Agree” or higher. The participant who selected strongly disagree in the pre-intervention increased to an “Agree” or higher frequency by the end of the program. Comfort in using knives increased from 70% selecting “Agree” or higher in the pre-intervention to 90% selecting “Agree” or higher at the post-intervention. Comfort in boiling water for preparing pasta or rice decreased from 80% selecting “Agree” or higher at the pre-intervention to 70% selecting “Agree” or higher in the post-intervention. Interest in helping parents out with cooking changed from 50% selecting “Agree” or higher at the pre-intervention phase, to 90% selecting “Agree” or higher in the post-intervention. Eighty percent of participants selected “Agree” or higher for wishing to help out more with cooking, however, 90% of participants selected that they ask to be more involved after participating in the program. Prior to the beginning of the program, only 50% of participants helped in making choices about what is eaten for dinner. After the program 80% are more involved in helping identify what will be made for dinner. Likewise, 60% of participants helped pick out items when going grocery shopping with their parents prior to the beginning of the program. That number increased to 90% for the post-intervention period. Sixty percent of participants indicated they like to eat vegetables prior to the beginning of the program. Seventy percent selected that they consume more

vegetables after completion of the program. The likeness of consumption of fruit remained the same from pre- to post- intervention.

The child self-efficacy survey contained additional questions assessing factors associated with feelings regarding foods and relationships with their grandparents. Table 4.3 contains these variables and the frequency of responses.

Table 4.3 Child Self-Efficacy Response Frequencies for Additional Variables

	Frequency of Responses				
Question	**Not At All**	**A Little**	**Some of the Time**	**Most of the Time**	**All of the Time**
Help Grandparents Cook					
Pre	10.00%	50.00%	30.00%	10.00%	-
Post	-	10.00%	30.00%	40.00%	20.00%
Think Family Eats Out A Lot					
Pre	20.00%	10.00%	70.00%	-	-
Post	30.00%	20.00%	50.00%	-	-
Knowing How to Cook Important					
Pre	10.00%	-	-	10.00%	80.00%
Post	10.00%	-	-	-	90.00%
Like Food Grandparents Cook					
Pre	-	10.00%	-	10.00%	80.00%
Can Learn from Grandparents					
Pre	-	-	20.00%	20.00%	60.00%

Can Learn Cooking from Grandparents					
Pre	-	-	20.00%	20.00%	60.00%
Like Food Parents Cook					
Pre	-	10.00%	-	30.00%	60.00%
Like to Help with Cooking					
Post	-	-	20.00%	10.00%	70.00%
Try More Vegetables					
Post	-	-	10.00%	50.00%	40.00%
Try More Fruit					
Post	10.00%	-	-	30.00%	60.00%

Some items were only asked during the pre-intervention phase and others were only assessed during the post-intervention phase. The questions are identified as pre-only or post-only. Sixty percent of participants indicated they help their grandparents make food when they visit them "Not at all" or "A little" prior to the beginning of the program. After the program, 60% of the participants indicated they helped "Most of the Time" or "All of the Time". Ninety percent of the participants indicated that they believed knowing how to cook was important. That number didn't change between the pre- and post-intervention phases. Ninety percent indicated they did enjoy the food their grandparents and parents cook, and 80% indicated they feel they can learn different things, including cooking skills, from their grandparents. Eighty percent of the participants indicated that after the cooking class, they like to help out more with cooking. Ninety percent of the participants

also indicated that as a result of the cooking program, they will be trying more fruits and vegetables.

Family meal frequency was also assessed with the child self-efficacy survey and the results are provided in Table 4.4. The question appeared as "How many times per week do you and your family have dinner together at home?" for the pre-intervention survey. Thirty percent indicated one-to-two time, 20% said three-to-four times, 40% stated five-to-six times, and 10% indicated everyday. The post-intervention questioned appeared as "After the cooking class, how many times per week do you and your family have dinner together at home? Ten percent indicated three-to-four times, while 90% indicated five-to-six times per week. Consumption of out of home meals was also assessed through the children. Seventy percent of the participants indicated that they "sometimes" feel that their family eats a lot of meals outside of the home. After the program, that number dropped to 50% of participants.

Table 4.4 Family Meal Frequency

	Frequency of Responses			
Question	**1-2 times/wk**	**3-4 times/wk**	**5-6 times/wk**	**Everyday**
Have Dinner Together at Home as Family				
Pre	30.00%	20.00%	40.00%	10.00%
Post	-	10.00%	90.00%	-

EFNEP Nutrition Knowledge Surveys

The EFNEP Nutrition Knowledge Surveys were administered only to the children. Age appropriate surveys were provided. The maximum scores obtainable by the Kindergarden-to-second, third-to-fifth, and sixth-to-eigth grade surveys were 27, 62, and 65 points, respectively. The average pre-intervention score for the Kindergarden-to-second, third-to-fifth, and sixth-to-eigth grade surveys were 17.8 ± 2.77, 49.0 ± 5.66, and 44 ± 11.31, respectively. Post-intervention average scores for the same grade breakdowns were 23.5 ± 0.71, 52.33 ± 4.51, and 49 ± 11.31. Figure 4.3 is a demonstration of the percentage score (score obtained/maximum score) obtained by the participants. Every participant demonstrated to have an increase in their nutritional knowledge from pre- to post-intervention.

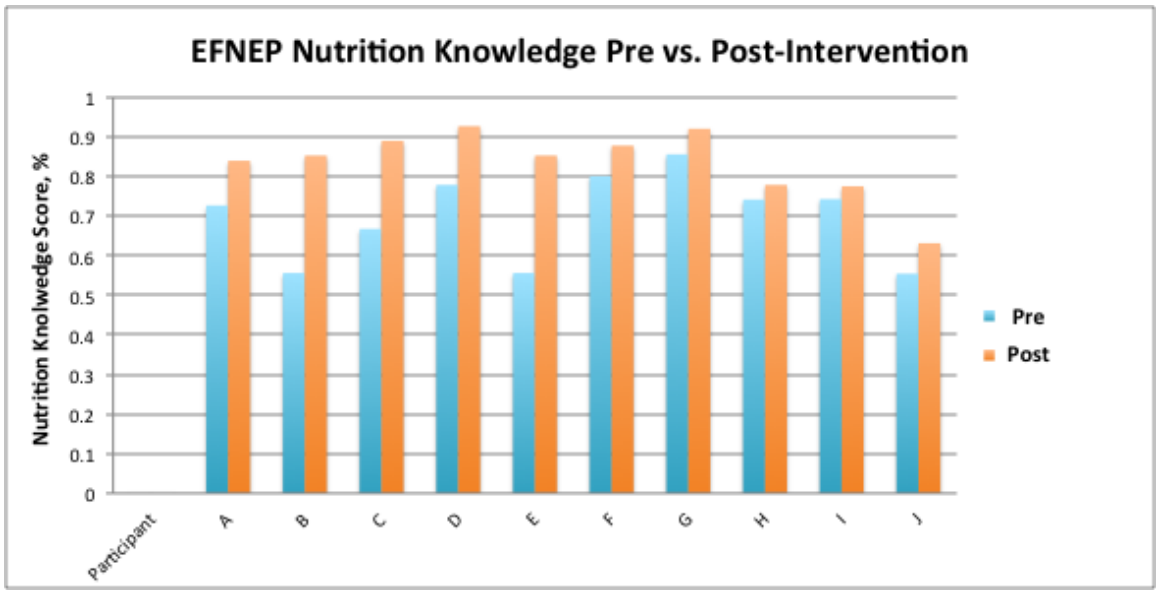

Figure 4.3 Comparison of pre- and post-intervention nutrition knowledge gaged by the EFNEP nutrition knowledge surveys. Scores are presented as percentages in order to compare across the board, despite having different, age-appropriate surveys.

G.E.T.T. Cooking Questionnaire

The G.E.T.T. Cooking questionnaire had a number of sections that addressed different variables. Only the grandparents took this survey and it was taken at the pre- and post-intervention phases. Some questions were only asked during the pre-intervention phases, such as access to food and demographic information. Those questions are designated as such. The following are those breakdowns and the results of the frequency of answers provided by the grandparents.

Access to Food

Eighty three percent of the participants indicated that their primary source of obtaining groceries was from a supermarket such as Bi-Lo, Food Lion, or Ingles. Megamarts, such as Walmart and Kmart, were indicated as the primary source by 16.7% of participants. Fifty percent of participants indicated that Megamarts was their secondary source of obtaining groceries. Most of the participants, 83.3%, indicated that it took them less than 10 minutes of travel to arrive at their primary source for groceries. The maximum amount of time selected was 10-15 minutes of travel time. Fifty percent of participants indicated they go grocery shopping once per week, 33.3% indicated they go two-to-three times/week, and 16.7% indicated they go two-to-three times/month. Appendix 13 provides the exact questions with the frequency of responses.

Factors Effecting Cooking Frequency

The researchers wanted to identify if there were any factors associated with impediments to frequency of cooking. A psychosocial variable identified was job or volunteer requirements. Thirty three percent of participants agreed that due to their job or volunteer requirements, they feel they don't have the time to cook as often as they would like. The other participants either disagreed with the statement, or felt indifferent. All participants disagreed with the statement "I don't have the access to fresh foods necessary to cook (healthy) family meals.". Eighty three percent of participants disagreed with the statement "I feel I don't have the skills to cook (healthy) meals for my family.". Sixteen percent felt indifferent. The results of these variables provide further evidence that the grandparents do have a high degree of cooking self-efficacy. Table 4.5 provides the exact questions with the frequency of responses.

Table 4.5 Frequency of Responses to Factors Effecting Cooking Frequency

	Frequency of Responses				
Question	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
Due to my job or volunteer requirements, I don't have the time to cook as often as I would like.	16.70%	33.30%	16.70%	33.30%	-

I don't have the access to fresh foods necessary to cook (healthy) family meals.	33.30%	66.70%	-	-	-
I feel I don't have the skills to cook (healthy) meals for my family.	50.00%	33.30%	16.70%	-	-

Family Meal Behaviors and Attitudes

Behaviors and attitudes towards foods and family meals are indicators of dietary habits. Grandparents were asked a number of questions assessing this information, along with their grandchild's involvement and perspective on food attitude and behaviors. Sixty six percent of grandparents agreed that they made an effort to have their grandchildren involved in meal planning. After the program, 83.3% "strongly agreed" that as a result of the program, they would make more of an effort to have their grandchildren participate in meal planning. Thirty three percent of participants agreed that they make an effort to involve their grandchildren in meal preparation and meal cooking, however, that number increased to 100% of participants indicating they "agree" or "strongly agree" that they make more of an effort to involve their grandchildren in meal preparation activities after participation in the program. All participants indicated that it was important to them to eat together as a family when their grandchildren were visiting. Sixty six percent of

participants indicated they attempt to introduce new foods to their grandchildren, however, that number increased to 100% after the intervention. Twenty percent of participants indicated they find it difficult to make meals that both they and their grandchildren enjoy. That number increased to 33.3% after the intervention. Fifty percent of participants indicated that they believe their grandchildren to be picky eaters, however, all participants "agreed" or "strongly agreed" to the statement "As a result of the program, I find my grandchildren are less of a picky eater.". All participants disagreed with the statement "I feel I am a picky eater." Eighty three percent of participants indicated that the program made them feel as though they were less of a picky eater. Most participants don't follow a strict diet due to health reasons, and 83.3% agree that they don't follow a balanced diet, but all indicated they feel they now have the skills to follow a healthy diet. Thirty three percent of participants indicated they did not feel they understood nutrition labels on foods, however, following the program, all participants agreed they understood nutritional labels on foods better. Sixty six percent of participants indicated they feel they eat out a lot, however, all participants indicated that as a result of the program, they have reduced the amount the eat out. Eighty three percent of participants felt they do not have any physical limitations to cooking on a regular basis. All participants indicated that after participating in the program, they now feel they can cook smaller meals at home. Eighty percent of participants indicated they turn off all distractions while eating a meal, but the number rose to 100% after the completion of the program. Forty percent of participants agreed that due to not having children in the home, they don't cook as often as they used to. Most participants (66.7%) indicated they spent

6-10 hours per week preparing meals. Thirty three percent indicated they spent 11-15 hours per week. After the completion of the program, only 33.3% indicated they spent six to 10 hours per week preparing meals, 16.7% indicated they spent 11-15 hours per week preparing meals, and 50% indicated they spent 16-20 hours per week preparing meals. Frequency of consumption of fast food meals remained constant at 1-2 times per week. Table 4.6 contains the exact questions and the frequency of responses.

Table 4.6 Family Meal Behaviors and Attitudes Response Frequency Pre- vs. Post-Intervention

	Frequency of Responses				
Question	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
Effort grandchildren participate in meal planning					
Pre	16.70%	-	16.70%	66.70%	-
Post	-	-	-	16.70%	83.30%
Effort grandchildren participate in meal prep					
Pre	16.70%	-	50.00%	33.30%	-
Post	-	-	-	33.30%	66.70%
Important we eat meals together					
Pre	-	-	-	33.30%	66.70%
Post	-	-	-	-	100.00%

Effort introduce new foods to grandchildren					
Pre	16.70%	16.70%	-	33.30%	33.30%
Post	-	-	-	-	100.00%
Difficult to make meal for all					
Pre	20.00%	60.00%	-	20.00%	-
Post	16.70%	50.00%	-	16.60%	16.70%
Grandchildren picky eaters					
Pre	-	16.70%	33.30%	33.30%	16.70%
Post	-	-	-	83.30%	16.70%
I am picky eater					
Pre	66.70%	33.30%	-	-	-
Post	-	-	16.70%	50.00%	33.30%
Follow strict diet due to health					
Pre	50.00%	33.30%	16.70%	-	-
Post	-	-	-	16.70%	83.30%
Turn off all distractions when eating					
Pre	-	-	20.00%	20.00%	60.00%
Post	-	-	-	-	100.00%
Understand nutrition labels					
Pre	-	16.60%	16.70%	-	66.70%
Post	-	-	-	16.70%	83.30%
Eating out					
Pre	-	16.70%	16.70%	33.30%	33.30%
Post	-	-	-	33.30%	66.70%

Follow balanced diet					
Pre	50.00%	33.30%	-	16.70%	-
Physically difficult to cook					
Pre	50.00%	33.30%	16.70%	-	-
Don't cook often					
Pre	40.00%	20.00%	-	20.00%	20.00%
Easier to cook smaller meals					
Post	-	-	-	33.30%	66.70%

Types of Foods Consumed

Types of foods consumed for four food groups, including fruits, vegetables, milk, and whole grains, were assessed using the G.E.T.T. Cooking questionnaire. All participants indicated that the majority of fruits purchased were fresh. This didn't change after participation in the program. The majority of vegetables purchased were in the fresh form, accounting for 83.3% of the participants selecting this response. After the program, however, the purchase of fresh vegetables decreased to 50%, with frozen comprising the other 50%. The milk normally consumed consisted of skim milk (33.3%), low fat milk (33.3%), reduced fat milk (2%), and other (lactose-free). After participation in the program, milk consumption changed slightly, with 50% consuming skim milk, 16.7% consuming low fat milk, 16.7% consuming reduced fat milk, and 16.7% consuming nondairy milk (i.e. almond, coconut, soy). Whole grain items were assessed as "How often do you have whole grain items, such as whole grain breads, pastas, and rice at

home?". All participants indicated it was often or all of the time. After participation, one-third of the participants indicated it was only sometimes that they had whole grain items at home. Consumption of sugar-sweetened beverages was distributed as never (33.3%), rarely (33.3%), sometimes (16.7%), and often (16.7%). After completion of the program, the frequency changed slightly with a decrease to 16.7% for never and an increase in rarely to 50%. Appendix 14 contains the exact questions and the frequency of responses.

Grandchild Involvement

Involvement of grandchildren in cooking and food related activities before and after participation in the program are factors essential to the success of the program. Eighty three percent of grandparents indicated that they consider their grandchildren's opinion when making dinner. That number remained the same after the program finished. Thirty three percent indicated that they make an effort to involve their grandchildren in meal preparing, however, that number increased to 83.3% after the program. Most participants also felt that their grandchildren enjoyed helping them out with cooking activities and that number increased to all participants after participation in the program. Eighty three percent also felt that their grandchildren feel comfortable in the kitchen and that number increased to all participants after completion of the program. Sixty six percent of participants indicated they have their grandchildren participate in picking out foods at the grocery store, take the opportunity how to pick out produce, and take the opportunity to teach their grandchildren about cooking. That number increased to all

participants upon completion of the program. Table 4.7 contains the exact questions and frequency of responses pre- and post-intervention.

Table 4.7 Grandchild Involvement in Cooking and Food Activities Pre- vs Post-Intervention

	Frequency of Responses				
Question	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
Ask grandchildren for opionion of what to make					
Pre	16.70%	-	-	50.00%	33.30%
Post	-	-	16.70%	33.30%	50.00%
Effort to involve grandchildren in preparing dinner					
Pre	16.60%	-	50.00%	16.70%	16.70%
Post	-	-	16.70%	33.30%	50.00%
Grandchildren enjoy helping cook					
Pre	-	-	16.70%	66.60%	16.70%
Post	-	-	-	16.70%	83.30%
Granchildren comfortable in kitchen					
Pre	-	16.70%	-	50.00%	33.30%
Post	-	-	-	16.70%	83.30%
Grandchildren help pick out groceries					

Pre	16.70%	-	16.70%	50.00%	16.60%
Post	-	-	-	33.30%	66.70%
Teach grandchildren about cooking					
Pre	16.70%	16.70%	-	50.00%	16.70%
Post	-	-	-	33.30%	66.70%
Teach grandchildren about picking produce					
Pre	16.70%	16.70%	33.30%	16.70%	16.70%
Post	-	-	-	33.30%	66.70%

Effect Size

Due to the nature of the study, effect size was calculated to identify the number of participants needed in order to identify statistical significance within the results. To do this, a correlation between self-efficacy scores of grandchildren and grandparents was identified for both the pre-intervention and post-intervention phases. Figures 4.4 and 4.5 provide a pictorial description of the relationship.

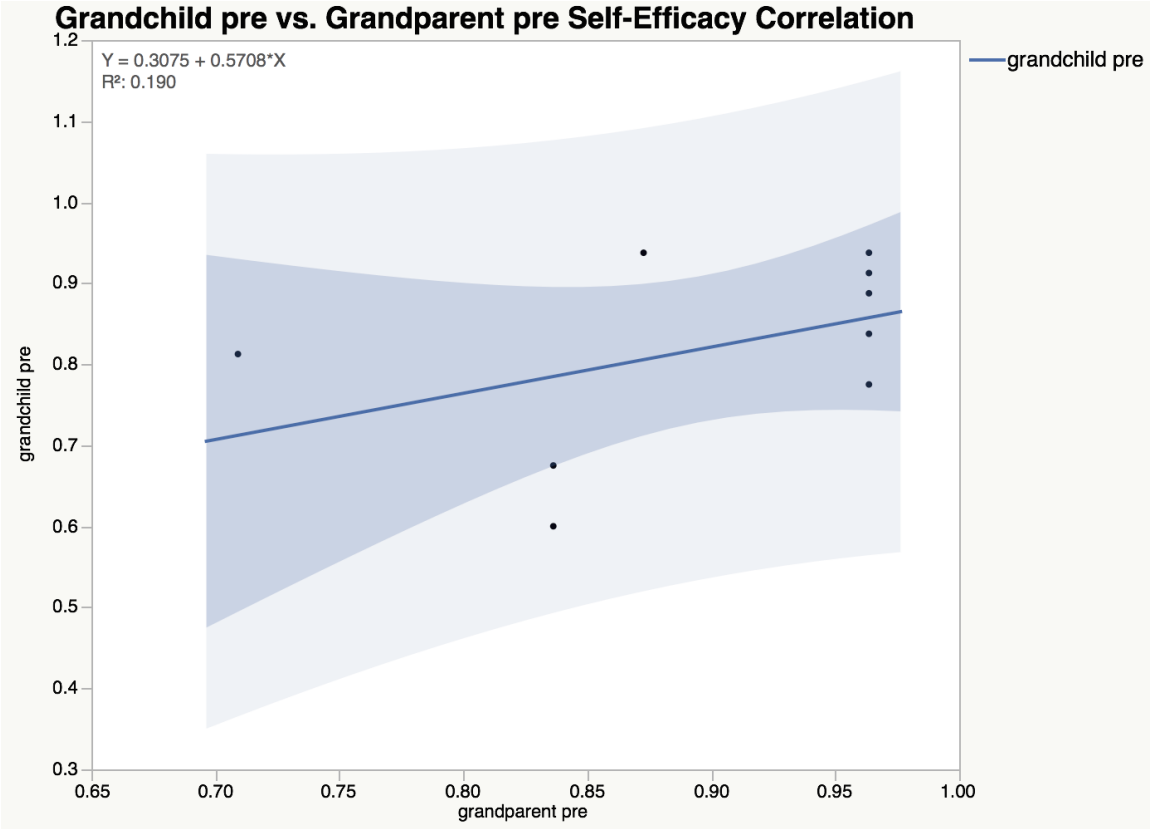

Figure 4.4 Correlation between self-efficacy scores of grandparents and their grandchildren at the pre-intervention phase.

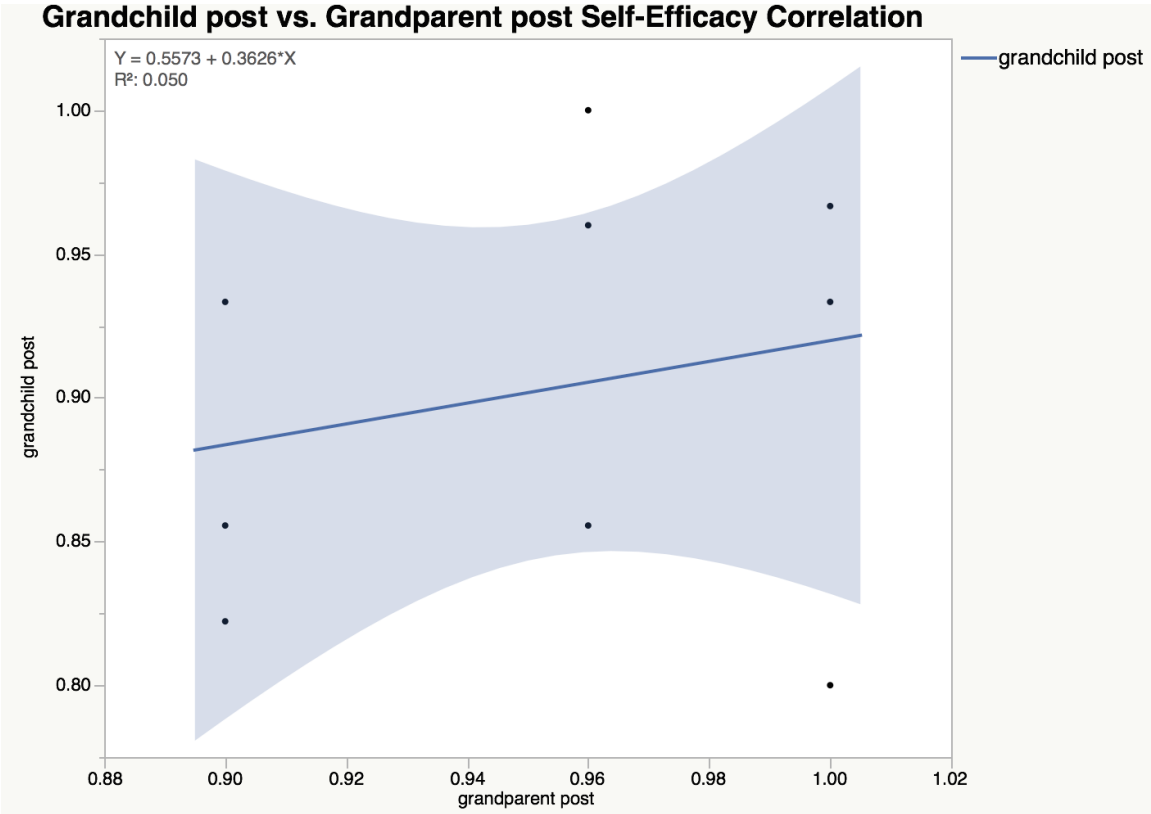

Figure 4.5 Correlation between self-efficacy scores of grandparents and their grandchildren at the post-intervention phase.

The correlation between the self-efficacy scores for the grandparents and their grandchildren during the pre-intervention phase was r=0.436. During the post-intervention, the correlation decreased by half to r=0.224. An effect size calculator [44] was used to identify the number of participants needed for a larger experimental study. Figure 9 illustrates the results. The "miss" is the difference in the 95% confidence interval. Since no study of this kind has been conducted before, an appropriate range for a confidence interval is unknown. However, it is understood that the smaller the confidence interval, the stronger the study and the more confident the researchers are in capturing the true

value for the population.[45] Taking that understanding, Figure 4.6 demonstrates how the confidence interval will get smaller as the number of participants increases. Increasing

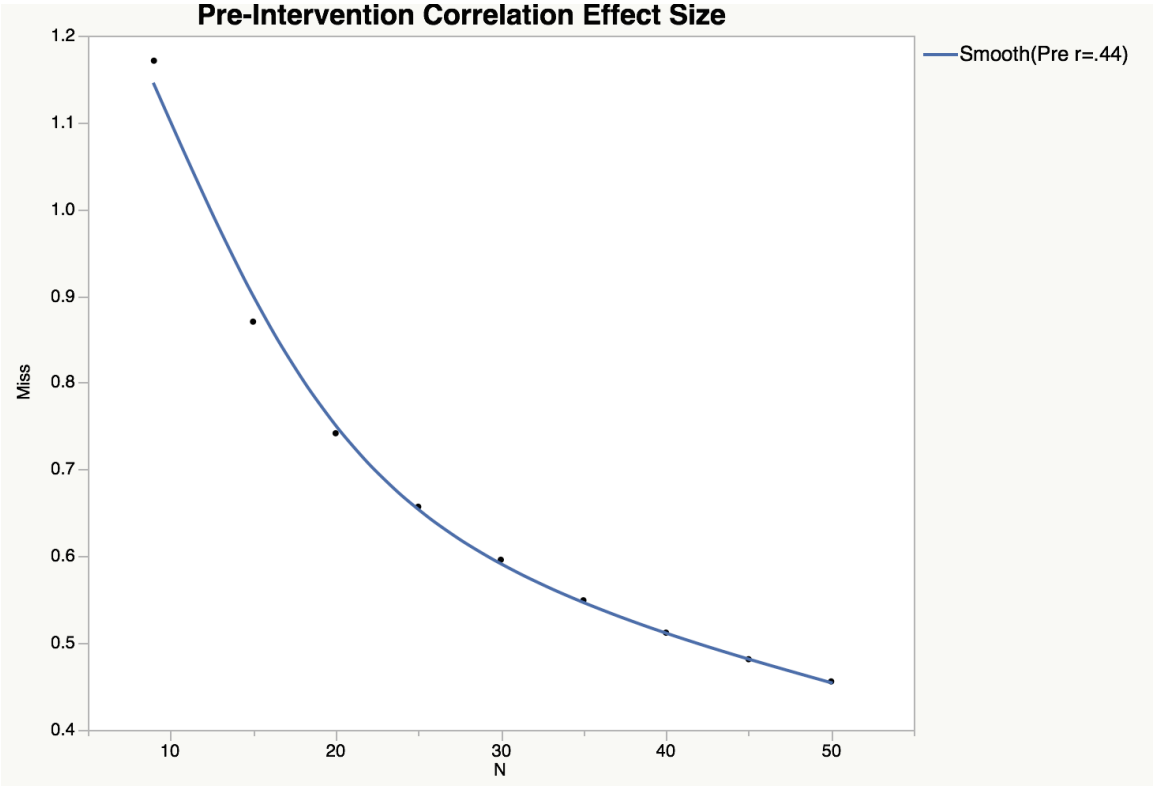

Figure 4.6 Graph depicting pre-intervention grandparent and grandchild self-efficacy correlation effect size and confidence interval range.

the sample size to 20 participants provides a confidence interval range of 0.7418. At 30 participants the confidence interval range is 0.5493. At 40 participants, that range decreases to 0.512. At 50 participants, that range decreases to 0.4558. The graph demonstrates that as the number of participants increases, the range decreases at a decreasing rate, thus approaching a state of "saturation" where the change between one

interval to the other changes very little. Figure 4.7 illustrates this same concept with the post-intervention correlation. At 20 participants, the confidence interval range is 0.8502. At 30 participants, that range is 0.69. At 40 participants, the range is 0.5956. At 50, the range is 0.5318. Identifying the pre-intervention correlation as the strongest relationship, an appropriate number of grandchild participants would be 30.

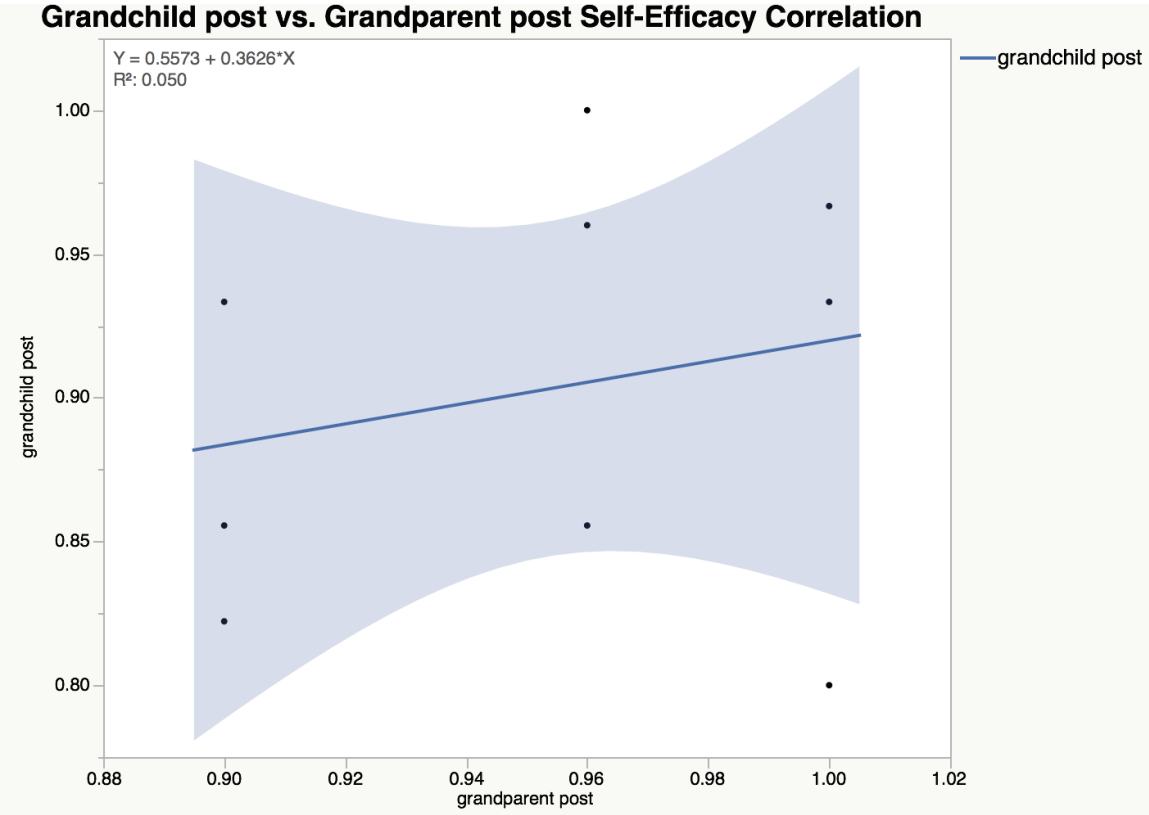

Figure 4.7 Correlation between self-efficacy scores of grandparents and their grandchildren at the post-intervention phase.

Discussion

Results demonstrated that participation in a hands-on, culinary curriculum with intergenerational participants can improve cooking self-efficacy. Figure 4.8 demonstrated the percentage self-efficacy scores for the grandparents in the pre- and post-intervention periods. In general, the average of the scores decreased from pre-to-post phases, however, this was due to the one participant whose score decreased from pre-to-post. In general, all of the participants had an increase in cooking self-efficacy. Most of the grandparents started with a high cooking self-efficacy. This was expected. During the 1950's, the

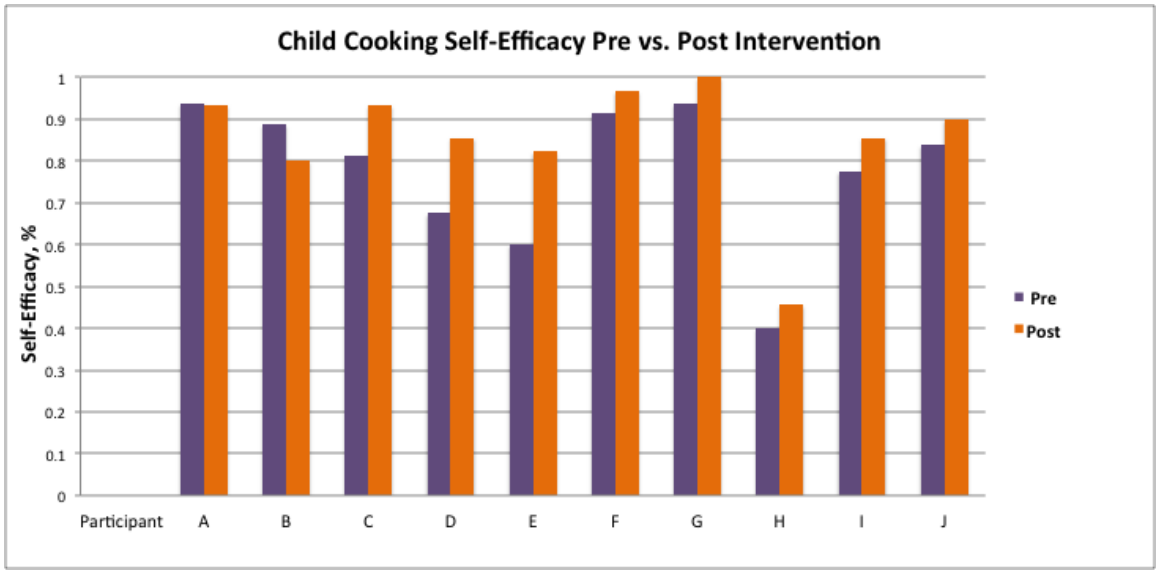

Figure 4.8 Comparison of pre- and post-intervention cooking self-efficacy percentage scores for children participants.

average woman spent about 20 hours per week in meal preparation.[23] During the 1960's and 1970's, when the participants were having and raising children, dining trends were

already changing. The surge of helpful technologies, such as crockpots and blenders, as well as the emergence of fast food eateries, resulted in decreased time being spent on cooking activities at home.[23] However, high schools and colleges were offering home economics courses where nutrition and cooking were taught.[23] The grandparents who participated in the program grew up in the time where cooking was still a significant part of "home-training". Thus, the grandparents came in with a high cooking self-efficacy. However, the results do demonstrate that the grandparents did improve their cooking self-efficacy. The use of new spices, herbs, and cooking and prepping techniques seem to be the factors responsible for these changes.

The cooking self-efficacy for the child participants demonstrated positive effects of participation in the program. Eighty percent of the children demonstrated an increase in cooking self-efficacy. Previous studies have demonstrated the positive effects of cooking classes and interventions on improving dietary behaviors in children as well as the importance of self-efficacy as a mediating factor for dietary changes in adolescents.[24] The LA Sprouts Gardening intervention is one example of a successful program that implemented a nutrition and cooking intervention, resulting in positive dietary and weight outcomes of the Latino children participants.[25] Interventions focusing on self-efficacy, including the school cooking club study by Gatenby et al.,[26] the Cooking with Kids intervention created by Cunningham-Sabo and Lohse,[27] and the EFNEP study conducted by Townsend et al.,[28] amongst others, have demonstrated the effectiveness of improving cooking skills in children and adolescents as a successful means of producing dietary and behavioral changes.

Family meal frequency was assessed through the children in their cooking self-efficacy survey. The children were more knowledgeable than their grandparents regarding family meal frequency. Half of the participants had indicated they ate as a family four times or less per week. After the cooking class, 90% of the participants indicated family meal consumption increased to five-to-six times per week. These values were later verified at the follow-up phone interviews with the parents. Studies have indicated the importance of family meal frequency as a protective factor in obesity and dietary health of the family, especially the children.[29-31] Increasing family meal frequency was one of the major outcome variables of the program. It demonstrates a transfer of information from the children to the parents, identifying that the children are understanding that eating as a family is important and that they have been able to send this message to their parents. Additionally, participants indicated that they felt they ate a lot of meals outside of the home prior to the program, but that number dropped after the program. This may be due to more consumption of meals inside the home related to the increase in family meal frequency. This may also be due to the participants asking to be more involved in the cooking process, encouraging parents to cook more often at home.

The increase in nutritional knowledge demonstrated by the children was an important component of the program. Even the youngest participant, at six years of age, improved their score. Understanding of nutrition and healthy behaviors, coupled with the increase in cooking self-efficacy, and having a familial component have been demonstrated to be key factors in having a successful, long-lasting intervention.[32] It was evident by the scores that the participants grasped and understood the information and the

format in which it was provided. All lessons were disseminated through the use of hands-on, interactive activities that engaged the participants and required the use of critical thinking skills. Additionally, many of the lessons built on each other, reinforcing the information taught in previous lessons. Other nutrition studies have also demonstrated the importance of hands-on activities on enacting dietary and behavioral changes of the participants.[33-35] The researchers feel that the implementation of the hands-on activities was one of the critical pieces in the success of the program.

The G.E.T.T. Cooking questionnaire provided an insight into a number of variables associated with dietary behaviors. Access to food was not limited, and only about one-third of the participants indicated that time was a factor to how often they cook. Participants indicated that involving their grandchildren in cooking activities such as meal preparation and planning were important to them, even though some indicated they didn't make the effort as strongly as they should have. However, participation in the program encouraged grandparents to involve their grandchildren more. Participation in the program also demonstrated to be important in development of skills and an increase in nutrition knowledge allowing for self-indicated improvements in healthy diets. Changes in fruit and consumption of sugar-sweetened beverages did not change much. However, the form in which the vegetables were purchased did change. There was an increase in the purchase of frozen vegetables. This may have been due to information regarding the quality of frozen vegetables and the use of frozen vegetables in recipes prepared during the program. There was also an increase in the numbers of ours spent per week preparing meals. This may be reflective of the increased cooking self-efficacy and

increased frequency of consumption of meals at home. In general, consumption of home meals are healthier due to out-of-home meals being higher in sodium, fat, calories, sugar, and low in fruits and vegetables.[36-38] This information may also provide support to the responses provided by the grandparents that they feel they are consuming healthier meals.

Grandchild involvement, prior to and after participation in the program, was important to assess the likelihood of sustained results. Grandparents indicated a relatively high level of grandchild involvement in meal preparation activities. However, these activities increased after participation in the program to a point where almost all grandparents were involving their grandchildren in meal and food preparation activities. The importance of intergenerational relationships has been studied previously. The notion of grandchildren learning cooking skills from their grandparents isn't a new one. Three particular studies found that nutrition education combined with a wellness or physical activity component aids in increasing the nutritional knowledge and efficacy of grandparents raising their grandchildren.[39-41] Influential factors regarding eating and the relationship with food are seen early in childhood and are closely tied to family.[42] Eating behaviors can come directly from the food served and eaten at home, and indirectly from familial commentary and restrictions about and on food.[43] Thus, the relationship and interactions that children have around food may influence the nature of the dietary behaviors they develop later in life. Involving grandparents in this influential learning environment may provide opportunities for positive associations with foods.

The effect size calculations allow the researchers to identify how many participants would be required in order to find statistical significance within the results of

the pilot study. The correlation of self-efficacy scores between the grandparents and their grandchildren decreased from pre- to post-intervention. This may be due to the fact that the grandparents already started off with a high self-efficacy score and there was little change from pre-intervention to post-intervention. The change was greater in the grandchildren. This may not accurately represent the relationship between the self-efficacy of the grandparents and the increasing self-efficacy of the grandchildren after participation in the program. Nonetheless, the correlation at the pre-intervention phase demonstrated to be medium in strength. The number of participants identified as needed to have statistical significance was 30.

Limitations and Future Implications

Due to the nature of the study, tests of significance were not able to be performed. The number of participants in the study was low, however, the study was able to provide rich data. Researchers were able to identify recipes and activities that resulted in self-efficacy change within the participants. The self-efficacy scales seemed appropriate for measuring changes in cooking self-efficacy of the children. The use of the G.E.T.T. Cooking questionnaire also allowed for identification of variables associated with dietary behaviors. The results of this pilot study did highlight some limitations. First, a larger number of participants are needed to really see the effects of the program on a larger population. Additionally, the participants were all white, middle-class Americans. It would be very interesting to see if the results would be paralleled in a low-income

minority population. The length of the study is also a limitation. The study was conducted over the summer when grandchildren visited their grandparents. The majority of the grandchildren are only able to interact with their grandparents for an average of one week during the summer due to residing in different states. Thus, the length of the program was set at four lessons. However, research has demonstrated that longer-term interventions are appropriate for nutrition education studies to be successful and produce change.[46] The researchers hypothesize that increasing the duration of the program would result in more significant changes.

Further limitations and future implications are discussed in Chapter 6.

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CHAPTER FIVE

THE EFFECTIVENESS OF THE G.E.T.T. COOKING CURRICULUM ON COOKING SELF-EFFICACY AND FAMILY MEAL FREQUENCY: QUALITATIVE ANALYSIS OF A MIXED METHODS PILOT STUDY

Introduction

Over the past decades, the rates of obesity have raised serious concerns. According to the latest statistics from the Centers for Disease Control and Prevention, 8.4% of two-to-five year olds, 17.7% of six-to-11 year olds, and 20.5% of 12- to 19-year olds are obese.[1] Additionally, many older Americans, especially those in rural-dwelling residents, suffer from diet-related complications, including cardiovascular disease, hypertension, and type-2 diabetes.[2] The creation of nutrition education programs aimed at assisting the US population in understanding nutrition and the importance of a healthful diet on like outcome has increased. As this public health concern becomes more serious, prevention, rather than treatment, becomes the emphasis of nutrition education.[3,4]

Interventions, such as Cooking up Fun!,[5] Eating Right is Basic,[6] and Cooking with a Chef [7] have been successful. Key components include both diet and physical activity components,[8] family involvement,[9] and longer-term interventions.[10] Another important factor in combating obesity in the US is less reliance on out-of-home meals and preparing more foods at home. The change in food purchasing habits,[11] increased consumption of out of the home meals,[12,13] and an increase in working mothers and single-parent households[14-16] exacerbates the obesity epidemic plaguing the US. The increase in readily available prepared foods, including convenience and pre-made foods, has resulted in a decrease in need of cooking skills. In tern, cooking becomes less of a

necessary skill, providing fewer opportunities for children to experience and gain cooking skills at home.[17-19] Developing cooking skills is an important developmental skill for children; one that will shape their future health. Research has demonstrated that a higher cooking self-efficacy leads to decreased consumption of out-of-home meals,[20] increased likelihood of preparing healthful meals,[21] increased knowledge and ability of selecting healthier options when eating out-of-home meals,[22] increased cooking frequency,[23] and reduced food cost.[24]

The researchers of this study intended to create a hands-on, interactive, culinary curriculum aimed at increasing cooking self-efficacy, nutritional knowledge, and family meal frequency of its participants. In this particular pilot study, the effects of the curriculum were examined in a group of intergenerational family members comprised of grandparents and grandchildren. The purpose of this study was achieved through development of a self-efficacy scale and use of an age appropriate nutritional knowledge scale. The results of the descriptive statistics, self-efficacy scale, and nutritional knowledge scale were discussed in Chapter 4. The aim of this chapter is to provide qualitative data that supports and aids in explaining the results seen in the previous chapter.

Methods

Study Setting, Study Design, and Recruitment

A detailed description of the study setting and recruitment are provided in Chapter 4.

Study Design

The researchers collected the qualitative data at three major points in the study. The first occurred after every lesson when the families were eating meals together. The lead research and instructor of the cooking class would ask the children to recall the lessons that were learned during the initial 30-minute hands-on activity phase. Secondly, the children were asked about what skills they had learned, and which were practice, during the cooking activity. Adults were asked if they learned anything new during the lessons or during the cooking activity. All participants were also asked about the food they prepared, if they enjoyed it, and weather they would be willing to prepare it at home. The second point at which qualitative data were collected was at the completion of the last class. Participants were asked regarding the lessons they had learned throughout the entire program, what were some of their favorite recipes, reiterate the skills they learned and how they were going to be more involved at home. The third major point of qualitative data collection occurred at the two-month follow-up through phone interviews. At this stage, all participants were contacted individually. Additionally, parents were interviewed. A list of the questions asked is available in Appendix 12. All interviews conducted were semi-structured and open-ended.

Data Analysis

The qualitative analysis consisted of screening the qualitative data for similarities and differences between families, coding and categorization of emerging themes, and

constant comparisons between responses provided by different families and the SCT constructs. NVIVO9 was used to analyze the qualitative data for emerging themes and for constant comparison. All interviews were recorded, transcribed, and analyzed for similarities and differences. Special attention was paid to responses that discussed self-efficacy, hurdles or facilitators to outcomes, goal attainment, and action plans. These topics formed the categories for which the data was coded. Emerging themes from the data were compared to the research questions. Additionally, emerging themes were compared to the literature on SCT.

Triangulation of the data, used to validate the qualitative data collected,[20] was performed. Data triangulation was performed by interviewing the grandparents, grandchildren, and parents. The data collected was analyzed for similar themes regarding changes in self-efficacy of the grandchildren and sustainability of any results seen.

Results

All participants were White and middle-class. All grandparents were retired but had some sort of responsibility that took up some time, such as volunteering. All grandparents were female and 80% of the grandchildren were female.

Family Meal Conversation

Lessons Learned

During the family meal conversations the participants were asked what lessons they had learned. Table 5.1 provides a summary of the lessons and the frequency with which each was stated. The lessons identified included MyPlate and its components, parts of the plant we eat and the participants' favorite examples, levels of physical activity and participants' favorite examples, using the hand for portion control, reading nutrition labels and the nutrients that should be restricted, healthy swaps and food safety.

Table 5.1 Frequency of Lessons Components Identified by Child Participants

Lesson Identified	Number of Participants Who Referenced the Topic
MyPlate and components	
Food Groups	10
Corn, potatoes, and green peas as grains	4
Parts of the plant we consume and examples	
Root = carrots, potatoes	10, 10
Stem = celery, asparagus	10, 2
Leaves = lettuce, spinach	10, 3
Fruit = strawberries, tomatoes	10, 10
Seeds = sunflower seeds	2
Levels of physical activity and examples	
Low energy = walking dog	10
Medium energy = basketball	8
High energy = swim, riding bike	9, 1
Using the hand for portion control	
Palm as meat size indicator	8
Fist as grain serving indicator	7
Thumb for 1 tablespoon	9
Index finger for 1 teaspoon	10

Reading nutrition labels and nutrients that should be restricted	
Calories	6
Fat	10
Sodium	5
Sugar	10
Protein	9
Restricted Nutrients, unassisted	8
Restricted Nutrients, assisted	10
Healthy Swaps	
Fruit for sweetness	10
Vegetables for crunchy	10
Water for thirst	10
Food Safety	
Washing hands	10
Use of separate cutting boards	9
Clean, separate, cook, chill	2
2 Hr max on counter	10
4 days max in fridge	10

All children participants were able to identify MyPlate and the food groups as fruits, vegetables, grains, protein, and dairy. Four participants were able to recall that corn, potatoes, and green peas were part of the grain group.

> " I learned that corn and potatoes are grains. I learned more new foods that I never heard of before, like couscous, and quinoa. Protein and dairy and fruits and vegetables are others. Fruits and vegetables should be half the plate." – nine year old female.

All participants were also able to recall the different edible parts of the plant. The parts identified were the root, stem, leaves, and fruit. Two participants recalled seeds as the final edible part of the plant. The most common examples provided for the root were potatoes and carrots, for leaves were lettuce and spinach, for stem were celery and asparagus, for fruit were tomato and strawberries, and for seeds were sunflower seeds.

> " Cauliflower and broccoli are flowers and there are some edible flowers like rose pedals you can eat. And we can eat the stalk like celery and roots like potatoes and carrots." – 10-year old female.

Physical activity was identified as sports and non-sports activities with three varying levels of energy. All participants were able to recall the three levels as high energy, medium energy, and low energy. The examples most provided were walking the dog as low energy, playing basketball as medium energy, and swimming as high energy.

> "Doing physical activity is really good for you. You can do low energy and high energy and medium energy!" – nine-year old female.

> "Physical exercise is important because when you eat, you need to balance out what you eat with how many calories you burn because everything has calories and so when you exercise you burn calories, because you don't want to eat a lot and not exercise or exercise too much and not eat enough." – 11 year old female

Nutritional labels were a little more difficult to grasp for the participants. The older participants were able to recall calories, fat, sodium, sugar, and protein as the main components of the nutrition label. The younger participants struggled more recalling the information. Sugar and fat were the nutrients most recalled by all participants. However, when the researcher asked the participants which nutrients should be kept lower and which ones should be kept higher, all participants were able to answer correctly when presented with the options. Two younger participants were able to recall the information by drawing a picture and pointing to where the nutrient is located. Portion control was discussed in the context of using one's hand to estimate sizes. The majority of the participants, 80%, were able to recall all of the examples of using the hand in order to determine portion control. The portions discussed were the palm of the hand for meats, a fist for grains, the tip of the thumb for one tablespoon, and the tip of the index finger for one teaspoon. A seven-year old female participant explained the following:

> "I realized the bigger the person you are, the more food you could eat and that is why you use your hand to measure and not someone else's."

A nine-year old female exclaimed:

> "I think it is crazy that you are only supposed to have that little bit of meat!"

The following exchange happened which highlights the understanding of the nutrition labels of a seven-year old female participant and her six-year old brother:

> " Nutrition labels tells you how much calories are in that food, and the serving size in the whole box or container. We need less calories. We also need less of the bottom things…sodium." – seven- year old female.
>
> "And what is sodium? Remember? Pinch, pinch?" – instructor
>
> "Pinch, pinch! Salt! And we need less sugar… low cho-les-tol…and protein high." – six-year old male.
>
> "And why do we need the protein to be high?" – instructor.
>
> "Protein we need it to keep our bodies strong!" – six-year old male.

The exchange above demonstrates the participants having a grasp on the concept of nutrition label reading and portion control.

Healthy swaps were discussed in the context of cravings and replacing foods with healthier versions. To curb sweet cravings, instead of candy, participants were taught to reach for fruit. To curb the craving for something salty and crunchy, participants were encouraged to reach out for vegetables and a healthy dip. When thirsty, participants were encouraged to drink water and 100% fruit juice instead of regular juice and sodas.

"Instead of candy I can eat a sweet fruit. For something crunchy, instead of chips I can have toast…or crackers…oh, yeah, vegetables! Best thing to drink is water and milk." – 13-year old female

Participants identified food safety practices that were important to follow. The use of multiple cutting board and separating fruits and vegetables from meat was recalled by all participants. Likewise, all participants had no problem identifying two hours as the limit for leaving food out on the counter and four days as the limit of having leftovers before disposing of it. The two oldest participants were able to recall the four steps to food safety as clean, separate, cook, and chill. During one activity, participants were asked to take laminated pictures of food items and identify if the foods need to be placed in the refrigerator, freezer, pantry, or trash. All participants performed well in the tasks, remembering that any items older than four days or with mold went into the trash.

"The food can only stay out for two hours and then we have to put it into the fridge for only four days. After it goes straight into the garbage!" – six-year old male.

New Practices Learned

The participants were also asked what new skills were learned during the cooking activity. Table 5.2 provides a comprehensive list of the new skills learned as identified by the participants.

Table 5.2 Most Frequently Stated New Skills Learned Identified by Child Participants

Most Frequently Stated New Skills Learned
Food Preparation
Cutting proteins (chicken, steak, fish, shrimp)
Cutting vegetables (onions, peppers, lettuce, cucumbers, tomatoes
Cooking
Making stir-fry
Cooking proteins (chicken, steak, fish, shrimp)
Cooking couscous
Cooking quinoa
Making salads
Making salad dressing
Making turkey burgers
Making tacos
Making meatballs
Trying New Foods
Fish and shrimp
Homemade salad dressing
Homemade turkey burgers
Tacos
Chimichurri
Couscous
Quinoa
Helping At Home
Cutting up vegetables
Making salads and salad dressing
Seasoning the meat
Making the whole meal

Skills can be separated into the following major categories: food preparation, cooking, trying new foods, and helping at home. Preparation of protein items, such as steak, chicken, fish, and shrimp were new for most of the participants. Several participants were hesitant, at first, with handling of raw protein items. However, encouragement from the grandparents and the instructor resulted in the participants overcoming their fear and becoming more involved with the cooking activities. Ingredients that were frequently mentioned by the participants as ingredients they learned to cut and prepare for cooking were chicken, fish, shrimp, peppers, onions, tomatoes, lettuce, and cucumbers.

> "I think I am used to cutting meats now because we have been practicing it." – nine-year old female.

Many items prepared during the cooking activities were new to the participants. Most have not helped cook before, and those that have had not been preparing items as complex as the ones prepared during the cooking classes. Cooking fish and chicken stood out as the most frequently stated ingredients that have never been cooked before. Making salad dressing from scratch was mentioned by every participant as something new they learned how to make. Making meatballs, turkey burgers, and tacos were all items that stood out as the most enjoyable to prepare by the children and as some of the tastiest recipes.

"Mom and dad are not going to believe that we can cook and I can help mommy make Chinese food now!" – seven-year old female.

"I learned how to make different salad dressings because when we use salad dressing we get it from a bottle." – nine-year old female.

"I cut raw chicken for the first time. I would do it again. It is the first time cooking chicken also. I feel comfortable helping mom make chicken now. I feel good I can also make salad on my own." – 13-year old female.

Trying new foods was one of the items most identified by the participants. Many of the recipes were recipes that used familiar ingredients but were prepared in a different manner. The fish was an item that stood out as one that many did not try before or were hesitant to taste. The chimichurri sauce was also new to everyone, including the grandparents. Items such as the couscous and quinoa were new to everyone as well, and many of the grandparents had never tried them before or did not like the taste from previous tastings. The homemade salad dressing was another item that was new for the participants, as no one had prepared their own salad dressing from scratch before.

"Trying things if you don't know what it tastes like is one of the things I learned." – eight-year old female.

"I liked the dressing more than bottled dressing." - 13-year old female.

"That food is really good! I've tried two kinds of fish, salmon and catfish. But this is really good!" – nine-year old female.

"I loved the fish and I really like the salsa! This is something that I could make at home. I feel pretty comfortable preparing fish after making this recipe." – 11-year old female.

Transferring the skills learned in the cooking class to the home environment was a particularly important component of the program. Thus, the lead researcher asked questions about what skills learned in the cooking class can be used at home and to provide examples of the things the participants would do at home now that they have learned some skills. The most frequently stated skill was cutting up vegetables to help make the meal. Others stated that making the salad on their own is something they would be able to do, along with the homemade salad dressing. Several participants stated that seasoning the meats would be a way they can help. A few participants exclaimed they can make some of the dishes entirely themselves back at home.

"Seasoning the meat, cutting the tomatoes, and making the patties is how we can help." – 11-year old female.

"The meal is delicious! I would make this at home! Maybe a little help to make it at home like with cutting the onions and cooking the chicken. But I can help and make the patties and pickling the onions!" – nine-year old female.

"I would go home and help mom make this dish at home, especially making the meatballs and cutting the vegetables." – eight-year old female.

"Making the chimichurri sauce was new. Making the whole meal was new. The food was good! I would make the recipe at home if I had it to follow." – 10-year old female.

"I'm going to go home and make these for my family!" – 13-year old female.

"We are going to cook for mama and papa tonight but it is a surprise! We want papa to see what we are learning!" – eight-year old female and six-year old male (siblings).

During the family meals, the grandparents aided in facilitating the conversation. Some said very few things as the children were excited to speak. Others encourages their grandchildren to say more. Yet others commented on the food and the participation of their grandchildren in the cooking activities. The following are selected quotes from the grandparents highlighting the food and participation in the program.

"I liked the rice. I will be trying to make the chimichurri sauce at home. The sauce is not too overpowering. The food is delicious. I am very impressed with the kids and how well they did!" – grandmother of two participants.

"You have a nice variety of recipes that you are teaching us. It is really nice. [Speaking to grandchild] you should try it. It is something different. You will like it." – grandmother of participant.

"The meal taste very good. You can cook with your dad and he is going to ask you if this is a challenge and your going to say no dad, this is a wipeout! (laughter from everyone)" – grandmother of participant.

"[Speaking to grandchild] Foods can be very delicious and very nutritious and that is what Elizabeth has been trying to teach us this whole time. Just because food is healthy doesn't mean it doesn't taste good. And just because a food taste good doesn't mean that it is bad for us. Elizabeth is teaching us that we can have both!" – grandmother of participant.

Final Class Interviews

Interviews were conducted with the families of the final day of the program. Questions addressing what was learned over the course of the entire program were asked.

Child participants talked about the lessons they learned, the skills they learned and practiced, and how they were going to be more involved at home. MyPlate, edible parts of the plant, and washing your hands were the lessons that stood out to the participants.

> "I remember that you have to wash your hands before you touch raw meat and after." – nine-year old female.

> "I learned to make the portions smaller and vegetables need to be the most." – eight-year old female.

> " We learned the different parts of the plant like stem, seed, flower, leaves, fruit, and root." – 10-year old female.

One seven-year old female participant particularly remembers food safety.

> " We cut the salad first and then we can cut meat because the juices from the meat may get all over the vegetables if we are using the same cutting board."

Skills discussed by the participants included cutting and prepping vegetables, using a knife, and making particular dishes including salad, tacos, and turkey burgers.

"We learned how to make salads and homemade salad dressing." -10-year old female.

"I feel more comfortable at home using a knife and cutting fruits and vegetables" – 13-year old female.

"I feel I learned a lot from here. I feel more comfortable in the kitchen." – nine-year old female.

"I really like the chicken and quinoa. I also like the stuffed squash. I liked all of it!" – 11-year old female.

"I learned how to wash my hands and cook like steak, onions, tomatoes, chicken cutting chicken…can't remember what else. MyPlate! The class was good and fun, a lot of fun! It was a lot of fun cooking with my grandma." – seven-year old female.

Questions addressing how the participants were going to help at home received the most enthusiastic responses from the participants. All were very excited to state how they were going to be involved more at home. Most mentioned in helping out with preparation of meals by cutting up the fruits and vegetables, seasoning meats, or helping in cooking the meal. Several participants expressed their likeness for the class and that

participation made them more comfortable around the kitchen and around knives. Most participants also expressed their enjoyment of cooking alongside their grandparent.

> "The cooking class makes us want to cook more and try to help out more when we go home." – 11-year old female.

> "It get us excited about cooking. It was fun to cook with grandma." – nine-year old female.

> "I can help by making salad, cutting vegetables up, or making some vegetables or some fruit." – nine-year old female.

> "You can have good food but you can also make it healthy." – 10-year old female.

> "I can cook chicken, maybe steak…maybe, with a little help. I can cook fish, I know that I could. I can make the stuffing for the squash any day. Salads and dressings too. I really want to get one of those blast things to make the sauces." – 11-year old female.

> "Whenever daddy make grits I like to help him make the eggs. He doesn't like me to do the pan part because I'm short but I can climb up on the desk and try to help. I can help them cut like tomatoes, lettuce…um…mixing! I only helped them with

the parts that were easy but not the parts that were hard but now I'm going to ask to help." – six-year old male.

" I loved the cooking class! I learned how to cook! Chicken tacos, pasta, salads, salsa, quinoa, tilapia…that was my favorite! I'm not better at cutting things in general." – nine-year old female.

"We would help mom out more in the kitchen with like cutting and seasoning and stuff and maybe helping come up with some recipes." – 13-year old female.

Some of the grandparents provided insight to some of the general lessons they also learned throughout the program. They included involving their grandchildren in cooking activities, how to prepare different recipes with different spices, and how to interact and engage their grandchildren in the kitchen.

"I can be more, even when I do cook something, I don't mind if they help, but I will be more proactive in encouraging them to help and asking them to help. They are willing, I just don't think about it. And I realize the importance of doing that and how that effects what they eat." – grandmother of participant.

"I think you learned a lot of the different foods you didn't like to eat before and now like because it was cooked differently (speaking to grandchild)." – grandmother of participant.

"I learned about some different spices and different ways you do things like pickling onions. I've never liked turkey burgers but the way you made them taste really good, not like cardboard. I liked the chicken tacos. I just thought it was fantastic and I just learned a different way to do things." – grandmother of participant

"The only thing I've ever made with them is desserts but never foods so this was neat to do this." – grandmother of participant.

Two-month Follow-up Interviews

Follow-up interviews were conducted two months after the completion of the project over the phone with the individual participants. Questions were asked to the grandparent participants, grandchild participants, and to the children's parents. All though the parents didn't participate in the study, researchers wanted to assess whether information from the child transferred to the parents or other members of the family and to see if the parents noticed any changes in their children's behavior. Table 5.3 summarizes the main lessons and activities mentioned by the grandchildren, parents, and grandparents.

Table 5.3 Key Lessons and Activities Mentioned in Follow-Up Interviews

	Lessons/ Activities Mentioned
Grandchildren	MyPlate Using hand for portion control Making different recipes Use of knives, cutting boards, plates Desire to help out more Desire to participate again Help out by cutting vegetables Help out by cleaning and setting the table Enjoyment of class
Parents	Time is a factor to involving kids in cooking Children excited to help out in other ways Children more likely to try new foods Benefits of participating in the program
Grandparents	Portion control New MyPlate guidelines vs. MyPyramid Allowing grandchildren to help out more Changes in dietary behavior of the grandchildren More awareness of what they eat Seeking out new and different recipes

Grandchildren

A couple of items were mentioned multiple times by the grandchildren as items they remember from the class. The use of Myplate and using the hand for portion control were the most mentioned. The different recipes that were prepared were also mentioned. Recipes most notably included tacos, turkey burgers, and tropical salsa.

> "I help out with cleaning the table and if I had the chance to help out with the cooking but we don't do much because of my schedule." – 11-year old female.

> "I remember making the salsa and the fish was my favorite and the pasta and the turkey burgers!" – nine-year old female.

The majority of the participants expressed wanting to help out with cooking more but due to busy schedules and school, it has been difficult. However, they do find the opportunity to help out whenever they can.

> "Well usually my mom like before I can ask to help with the cooking my mom has already cooked but sometimes I help set the table, clean up, and wash dishes, and I make snacks for my little sister." – 10-year old female.

> "I am putting the skills to practice like cutting and stuff and what different foods to use. So I cut a lot of vegetables and sometimes meat like chicken or pork. Oh and fish! Yes I do help out, like sometimes I set the table, sometimes I prep things before they need to be cooked, like cutting vegetables ore seasoning or something like that." – nine-year old female.

One participant in particular has been able to prepare a number of recipes on her own.

"Um, some things I have made are like fish, like fish tacos, or I've made pork once before, and I've also made chicken stir-fry and that one squash meal we made. Oh yeah my family really liked it!" – 11-year old female.

The toolkits were highly used by the participants. Items most commonly used were the knives, cutting boards, and plates.

"Yes, I use the toolkit. I use the measuring cups for baking and I use that one knife a lot and the cutting boards." - nine-year old female.

"We use the cutting boards and the knives a lot and the plates some and the basket." – seven-year old female.

Every participant expressed their enjoyment for the class, the usefulness of the class regarding learning how to cook, and the quality time spent with their grandparents. All participants mentioned that if given the opportunity, they would participate in another cooking class.

Parents

All parents mentioned that they did see a sustained difference in their children's attitude towards food and in their willingness to help out with food activities. All mentioned that time was the largest factor involved in the reduced participation in

cooking activities from the children. However, many mentioned their children's desire to help out and continue practicing what they learned when they can. Certain lessons stand out to the parents as the children change their habits. Those lessons include portion control, eating healthier, and using more fresh ingredients vs. processed ingredients.

> "I noticed that there was more of a change in helping to clean up after the meal, not so much with preparing it. They clear the table, load dishwasher, put food away. Sometimes they help out with picking out the foods…and they have suggestions on what to buy and help pick those items out." – mother of two participants.

> "The hard part was they did it right before school started and really haven't had an opportunity to really get involved, but they are really looking forward to doing it during the summer." – mother of participant.

> "Yeah she loves to set the table and if we need to cut vegetables she will do that. Even when she is preparing the food she reminds us of the things she has already made like the steak and pork stir-fry. And she is very confident cooking it and knowing the temperatures and stuff of when they are done." – mother of participant.

> "She has talked about as far as health wise what is a little healthy and those kinds of things. She reads labels but its more that she wants fresh items rather than processed, like cooking from scratch rather than premade stuff, and this has been after the cooking class." – mother of participant.

Grandparents

Grandparents were asked about any changes they had noticed in their grandchildren as well as any lessons that stood out or new techniques they learned. The majority of the grandparents had not interacted with their grandchildren since the end of the program due to the grandchildren only being there for a visit. However, all of the grandparents have had phone conversations with their grandchildren and have followed-up on effects of participating in the cooking class.

> "She loves to be in the kitchen and learning some of those skills have really helped her flourish in that. She wants to do more and her dad now allows her to do more on her own because now she knows how to do things she couldn't before because its not dangerous anymore." – grandmother of participant

> "When she is here I would allow her a lot more to do then before because she can handle a knife now and is more comfortable and knows what she is doing so I don't have to be with her telling her 'oh honey you need to cut it this way' because she already knows." – grandmother of two participants.

"You gave those little plates to the girls and they use them everyday. I was surprised when I went over there and they were up there in the cupboard and I asked their mother and she said yes they love them and it reminds them. She said they don't always do it but it reminds them of how much they should eat. So she said they are more aware of their vegetables." – grandmother of two participants.

"I think the class has made it easier for her to try new things. Because you presented all these new things she never tried before and all the spices and now we go somewhere or when I bring something over, I remind her she liked the things she never tasted before and that she needs to try it and so she is more willing to try new things." – grandmother of participant.

"You taught me about cooking all of those things that you made. Yes I do look for other recipes now and the spices that you use. Yeah I like your food!" – grandmother of participant.

Social Cognitive Theory Constructs

Table 5.4 provides an outline of the six constructs making up the social cognitive theory (SCT). The table also includes what lessons and/or activities from the program address that construct and what were the outcomes.

Table 5.4 Social Cognitive Theory Constructs and Program Activities and Outcomes

Social Cognitive Theory Constructs	Lessons and/or Activities	Outcome
Reciprocal Determinism	All parts of program provide opportunities of identifying barriers to following a healthful diet and steps to overcoming them are presented. Examples include cooking skills, dislike in taste, helping at home and at grocery store, etc.	Participants are more aware of doing their part in helping prepare a meal or continue having a balanced life balancing diet and exercise. More willing to try new items.
Behavioral Capability	All lessons provide examples and activities on how to perform the lessons learned. Participants participated and provided own examples of their favorite activities already performed.	Goal sheet provided with toolkit reinforces lessons learned and behaviors associated. At follow-up, participants follow the goal sheet as reminder of what they should do.
Expectations	Lessons discussing MyPlate, Nutrition, and Physical Activity provided examples on how to use MyPlate and types of physical activity and why they are important.	Participants demonstrated an understanding of "balance" by balancing food intake with exercise.
Observational Learning	Grandparents involved in teaching the grandchildren how to prepare recipes. Instructor used as a facilitator. Grandparents serve as a role model for preparing the foods and trying the recipes, including new items never tried before	Increase in cooking participation by children at home and grandparents' home. Willing to try more foods. Help out in multiple aspects of food preparation, including cutting up vegetables and cleaning up.
Self-Efficacy	Cooking activities aimed at increasing the knowledge and skills surrounding cooking	

Reinforcement	Positive verbal reinforcement by grandparents and instructor throughout the program. Receipt of toolkit providing recipes, spices, utensils, and goal sheet.	

The first construct of the SCT is reciprocal determinism, defined as understanding the personal, behavioral, and environmental factors associated with producing the intended change. The program addressed this construct throughout the curriculum, providing opportunities in identifying barriers to healthful eating. Examples include addressing cooking issues, nutritional knowledge and understanding, exposure to foods, and involvement at home. The data demonstrated that participants did become more aware of those factors by increasing their involvement at home, continuing their balance of diet and physical activity, and their willingness to try out new foods.

The second construct is behavioral capability, defined as how to incorporate the intended behaviors into daily life. Again, all lessons provided examples of this and were reinforced through hands-on and interactive activities as well as during the cooking activities. Goal sheets were provided at the completion of the program highlighting the behaviors that should be practiced. Appendix 15 has the sheet provided to all of the participants. At the follow-up interview, parents expressed the use of the goal sheet by the children as a means to remembering what the goals are and how to achieve them.

The third construct is expectations, defined as the outcome or benefits of implementing the new behavior. A number of lessons were specific in the expectations and these included MyPlate, Nutrition, and Physical Activity lessons. They provided

examples and activities that demonstrated how, and the benefit of, implementing the new behavior. The qualitative data provided evidence that the participants understood the expected behavior and mentioned the use of balance, defined as balancing food intake with exercise.

The fourth construct is observational learning, defined as having a role model perform or model the behavior. This was accomplished by having the grandparent participate in the classes with the children. The grandparents were involved in the entire aspect of the program. They modeled the behavior by cooking with the participants, eating with them, and encouraging them to try any and all foods prepared.

The fifth construct is self-efficacy. For this program, self-efficacy was the largest component, having the participants be involved in all aspects of the cooking activities. Lessons taught the importance of having the cooking skills indirectly by educating the students about nutrition and healthy lifestyle behaviors. The cooking aspect reinforced all of the lessons learned and provided many opportunities for the participants to become comfortable and increase their confidence in their ability to cook. The quantitative data demonstrated an increase in cooking self-efficacy. The qualitative data supported this, with participants stating that they were more comfortable handling a knife, more comfortable handling raw protein items, and more comfortable with helping out and preparing dishes.

The final construct is reinforcement. Though this is seen throughout the program, a reinforcement toolkit was provided to the participants. Appendix 16 has a picture of the tool kit. The tool kit included a basket, an apron, two cutting boards, measuring cups,

measuring spoons, a knife with a protective sheath, a plate with MyPlate etched on it, spices, a laminated goal sheet, and a certificate of completion. The intent of the toolkit was to reinforce the behaviors learned during the program.

The last three constructs had the same outcome. At the follow-up period, there was an increase in cooking participation by the children at home and at their grandparent's house. The children were more willing to try more foods, help out in different aspects of meal preparation, including cutting up vegetables and cleaning up, and in general were more interested in cooking.

Discussion

The qualitative data provided insight into the results seen in the quantitative analysis presented in Chapter 4. One of the most outstanding results was the increase in cooking self-efficacy seen by the child participants. The qualitative data provides evidence that the children were learning how to become more comfortable in the kitchen, handling a knife, and handling produce and raw meats. As the classes progressed, the more experience the participants gained, and the more comfortable they become participating in cooking activities. All participants demonstrated an interest in helping out at home, mostly with cutting up fruits and vegetables in preparation for cook meals. Research has demonstrated that a high cooking self-efficacy is beneficial for the entire family. Larson et al.[25] looked at the frequency of meal preparation and grocery shopping conducted by adolescents and found that there was a positive association between meal preparation and fruit consumption in males and meal preparation and fruit

and vegetable consumption in females. Another study comparing a cooking and tasting curriculum with a tasting-only curriculum found that the cooking and tasting curriculum was significantly better at increasing self-efficacy, increasing fruit and vegetable preferences, and improved cognitive behaviors in mediating healthful food choices.[26] Studies have demonstrated that about 10% of the US adult population do not have the skills to prepare home-cooked meals, and many young adults have very limited experience in food preparation and also lack the skills to follow a recipe.[27-29] It is evident that involving children in cooking opportunities is pertinent to the future health of the public.

The increase in nutritional knowledge was also seen amongst the majority of participants. Lessons about Myplate, its components, and examples of the food groups, physical activity, reading nutrition labels, portion control, and food safety were themes that continued to emerge throughout the qualitative data. Research has demonstrated over and over again the importance of nutrition education, especially as a preventative mode for combating the prevalence of obesity, due to the difficulty in changing established dietary patterns in children.[30] However, knowledge alone is not enough to be successful. [31,32] The combination of a familial component,[9] hands-on and interactive activities,[33] and an increase in cooking knowledge and skill [33] are all parts of the same equation. The G.E.T.T. Cooking curriculum was able to take all of these components and demonstrate an increase in knowledge and skill that are pertinent to the success of a program.

The follow-up interviews provided insight as to the sustainability of the results seen at the conclusion of the program, and barriers to cooking. The most frequently

mentioned barrier was time. The course was offered over the summer when the participants were out of school. However, once the school year began, the participants found very little time to help with preparing dishes and spending time with their grandparents (for the local ones). The desire to continue cooking was expressed by all participants and most mentioned that they help out when they can, such as setting the table and cleaning up. Several mentioned looking forward to summer to be able to cook more often and with their grandparents again.

Following the constructs outlined by SCT, the G.E.T.T. Cooking curriculum was able to enact change, mainly increasing cooking self-efficacy and nutritional knowledge, of its participants. The results were seen to be sustained at the follow-up period. Barriers to participation in cooking activities by the children were identified, however, the qualitative data demonstrated that the lessons and skills learned during the program were recalled and put into action whenever possible.

Limitations and Future Implications

Several limitations were identified for this study. First, this is the first time the lead researcher has performed a study of this kind. The novelty of being a human nutrition researcher may have resulted in missed opportunities to capture richer data. For instance, a researcher with more experience may have been able to probe with better questions during the interview and pick up other barriers to cooking not identified by the lead researcher. Additionally, the small number of researchers involved in the project identifies another limitation. The lead researcher was responsible for creating the

program, disseminating it with the assistance of only two undergraduate students, instructed all of the classes alone, and performed all of the data collection, including the interviews. Having some degree of separation may have resulted in less biased data collection and analysis. As the person who developed the research and identified the research questions, the lead researcher will be paying higher attention to certain answers, as opposed to an outside person tasked with conducting interviews who has no stake in the outcome of the research.

The results of this study provide promising opportunities for continued research. The researchers hope to implement the program with a larger, more diverse audience, and determine if the program is still effective and if other barriers emerge. The preliminary results of this pilot study did demonstrate that the use of the SCT as a guide to creating a hands-on interactive cooking based program can have lasting effects on the self-efficacy and nutritional knowledge of children participating with their grandparents.

Limitations and future implications are discussed in more detail in Chapter 6.

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CHAPTER SIX

LIMITATIONS AND FUTURE IMPLICATIONS

Introduction

The development and pilot study of the G.E.T.T. Cooking programs has provided a significant amount of data. Chapters 4 and 5 of this dissertation provide details of the quantitative and qualitative data collected. Overall, the pilot test demonstrated that the curriculum was effective at increasing cooking self-efficacy and nutritional knowledge of the child participants. The same, but to a much lesser degree, can be stated about the grandparent participants. Participant recollection of lessons and materials covered were sustained at the two-month follow-up period. Additionally, all participants demonstrated a very positive view of their experience in participating in the program.

The G.E.T.T. Cooking program is a first of its kind, utilizing an intergenerational relationship between grandparents and grandchildren as a medium for acquiring skills and changing dietary and behavioral knowledge. The novelty of the research project coupled with the positive results, provides numerous opportunities for future research. However, there were a number of limitations presented throughout the study. The purpose of this chapter is to provide further detail on the limitations and the opportunities for future research.

Limitations

A number of limitations were present throughout the study that may have impacted the results. The first limitation is the number of participants. Though this

dissertation was a pilot study of the G.E.T.T. Cooking program, only six families, with a total of 10 grandchildren, participated. Due to this small number of participants, tests of statistical differences could not be performed. Thus, all quantitative data and any changes were noted as numerical changes. An effect size was calculated and the data is presented in Chapter 4.

Another limitation of the study was time. The original G.E.T.T. Cooking program was developed as an eight-lesson curriculum, intended to be implemented on eight separate days. However, due to the nature and relationship of the participants, it was nearly impossible to obtain grandparent-grandchildren dyads for more than four days. About half of the participants lived in different states. The grandchildren were visiting their grandparents for a week during the summer and thus were able to take advantage of the opportunity provided by the curriculum. Likewise, those who live in the same state also demonstrated to have complications with meeting more than four days. Many of the grandchildren are involved in a number of summer activities, including sports and camps. An eight-lesson program would have to be spread over the course of several weeks in order to be completed. However, a benefit of the shorter timeframe resulted in a lack of attrition by participants. All participants came to every class and completed the entire program as well as participated in the follow-up interviews. Expanding the program to be completed over the course of several weeks may result in less than 100% attendance and participation in the program.

Researcher bias is another limitation of the study. The lead researcher was responsible for creating, developing, implementing, collecting data and analyzing the

G.E.T.T. Cooking program. With the exception of two trained undergraduate students, there was no additional help in the execution of the research. This provides a researcher bias that would otherwise be diminished if more researchers were involved. Having separation, especially during data collection, would aid in reducing the researcher bias.

The use of a five-point Likert-type questionnaire is another limitation. The data generated from a Likert-type question is ordinal and arithmetic manipulation, such as in calculating means, is not as strong as if the numbers were on a continuous scale. The use of a sliding scale would be more beneficial, especially in the self-efficacy surveys, allowing for true quantification of skill.

Reliability and validity of evaluation and assessment tools used in any research is important to the reliability of the results obtained. One of the limitations of this study was that the assessment tools were adopted from previously validated tools. The assessment tools used contained both validated questions as well as questions the lead researcher generated from important factors identified in the literature. The lead researcher did not test the reliability or validity of the items once they were adopted. Future research should concentrate on the reliability and validation of the assessment tools used.

Cooking self-efficacy was assessed using a pre-intervention and post-intervention assessment tool created by the lead researcher. Though both tools assessed the same variable, the tools differed slightly in the wording and in the questions that were asked. This was true of both the child and adult versions. This resulted in the inability to do a direct comparison of cooking self-efficacy from pre-to-post intervention phases using raw scores. The scores were converted into percentage points in order for comparisons to be

made due to the differing possible total points available. This is a limitation of the study. Future studies should assess cooking self-efficacy with the same scale being used during the pre- and post-intervention phases.

Future Research

Opportunities for future research are abundant. Most notably is the implementation of the curriculum with a larger, more diverse population. The study was conducted with a small homogenous population of White, middle-class Americans. Implementation of the G.E.T.T. Cooking curriculum with an ethnically diverse, low-income population would provide rich data regarding the applicability of the program. Due to the nature of the curriculum and the large role cooking plays as a mode of skill development, it is important to locate sites with a kitchen. Churches provide a great opportunity to reach a population of interest while providing an appropriate site in which to implement the curriculum.

Accessing a larger, more diverse population would also provide opportunities for assessing the impact of an intergenerational grandparent-grandchild relationship on skill development and nutritional knowledge. Studies have demonstrated that an increasing number of homes have three generations present.[1] Within that population, Hispanics and African-Americans comprise the largest percentages. It is also common practice that homes with three generations rely more often on the grandparent to prepare meals for the home.[2] This increased communication and interaction between grandparents and other generations within the family can be fostered and used as a key education component for

the family. Thus, implementing a curriculum that focuses on the role of the grandparent as a medium to skill development and knowledge acquisition may perform with a higher degree of success than what was identified in this pilot study.

Follow-up interviews with the participants identified as school being the largest barrier to child participation in cooking activities at home. The study was conducted during the summer when the children were not enrolled in school. However, shortly after the completion of the program, all children participants returned to school. The time required to attend school and be involved with after-school and extra-curricular activities resulted in significant decreased participation in cooking activities at home. All participants demonstrated to have an interest to continue cooking but found it difficult to do so. Thus, other opportunities arise. Implementing the curriculum as an after-school program may provide a ideal opportunity for children to continue practicing their cooking skills, learning new skills, and acquire more nutritional knowledge. This may also be beneficial if implemented in low-income communities as a means to keep children occupied and out of dangerous situations or environments.

Nutrition education interventions continue to be studied and an identified factor has been the length of the intervention.[3] An intervention that is too short will not produce the desired outcomes. An intervention that is too long may result in high levels of attrition. The G.E.T.T. Cooking curriculum was originally produced as an eight-lesson curriculum, however it was implemented as a four-lesson curriculum due to the nature of the participants. The intervention was completed in four consecutive days and no attrition was reported. The level of saturation and information exposure was very high which may

have positively influenced the results. This may have created an opportunity where the participants were required to remember and apply the information and skills they learned resulting in a higher degree and greater quality of information recall. Future studies may test the effectiveness of implementing the curriculum over a longer period of time or as the originally intended eight-lesson curriculum. It is probably that a dose-dependent response may be present and an optimal "dose" (number of lessons over a period of time) identified.

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APPENDICES

Appendix 1

Adult Self-Efficacy Pre-Intervention Survey

G.E.T.T. Cooking Summer 2015 Adult Self-Efficacy Pre-Survey

Family Code: _____ Participant code: _____

Thank you for taking the time to fill this survey out! Please answer the questions as best as you can and as truthfully as you can. There are no wrong or right answers.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I feel comfortable preparing baked chicken.					
I feel comfortable preparing a casserole.					
I feel comfortable preparing lasagna.					
I feel comfortable preparing complex dishes, such as Beef Wellington.					
I feel comfortable preparing seafood dishes, including fish and shellfish.					
I feel comfortable preparing poultry dishes					
I feel comfortable preparing meat dishes.					
I like to use herbs and spices when I cook.					
I would like to learn how to use more herbs and spices in my cooking.					
I prepare dishes from cultural backgrounds other than mine.					
I would like to learn how to prepare dishes from cultural backgrounds other than mine.					

Are there any foods you feel uncomfortable preparing?

Are there any specific dishes you would like to learn how to cook with your grandchildren?

Are there any specific skills you would like your grandchildren to take from the cooking class you will be participating in?

Appendix 2

Child Self-Efficacy Pre-Intervention Survey

G.E.T.T. Cooking Summer 2015 Child Self-Efficacy Pre-Surv

Family Code: _____ Participant code: _____

Date: _____

Thank you for taking the time to fill this survey out! Please answer the questions as best as you can and as truthfully as you can. There are no wron or right answers.

How old are you? _____

How often do you visit with your grandmother/grandfather?
- Every day
- 2-3 times per week
- Once per week
- 2-3 times per month
- Once per month
- Only on Holidays

Do you help your grandmother/grandfather cook or make food when you visit them?
- Not at all
- A Little
- Some of the Time
- Most of the Time
- All of the Time

Do you like spending time with your grandmother/grandfather?
- Not at all
- A Little
- Some of the Time
- Most of the Time
- All of the Time

Do you think you can learn different things from your grandmother/grandfather?
- No
- A Little
- Some things
- A lot of things
- Yes

Do you think you can learn about cooking from your grandmother/grandfather?
- No
- A Little
- Some things
- A lot of things
- Yes

Do you like the food your grandmother/grandfather cooks?

- No
- A Little
- Sometimes
- Most of the Time
- Yes

Do you like the food your mother/father cooks?

- No
- A Little
- Sometimes
- Most of the Time
- Yes

Do you like to cook or help out with cooking?

- No
- A Little
- Sometimes
- Most of the Time
- Yes

Do you think knowing how to cook is important?

- No
- A Little
- Sometimes
- Most of the Time
- Yes

Do you want to learn more about cooking and how to help in the kitchen?

- No
- A Little
- Maybe
- Yes

How many times per week do you and your family have dinner together at home?

- 1-2
- 3-4
- 5-6
- Everyday

Do you think you and your family eat a lot of meals outside of the house?

- No
- A Little
- Sometimes
- Most of the Time
- Yes

G.E.T.T. Cooking Summer 2015 Child Self-Efficacy Pre-Survey

The following questions are about how you feel and what you do in your house with your parents. Place an x or □ inside the box that best answers the question for you.

	Not at All	A little	Some of the Time	Most of the Time	All the Time
I feel comfortable peeling fruits and vegetables.					
I feel comfortable cutting fruits and vegetables.					
I feel comfortable touching raw meats like chicken and pork.					
I feel comfortable touching cooked meats like chicken and pork.					
I feel comfortable touching raw fish.					
I feel comfortable touching cooked fish.					
I feel comfortable making a green salad on my own.					
I feel comfortable cooking meats like chicken or pork.					
I feel comfortable using knives to help in cooking.					
I feel comfortable boiling water for cooking rice or pasta.					
I like helping out when my mom or dad is cooking.					
I wish I helped out with cooking more.					

G.E.T.T. Cooking Summer 2015 Child Self-Efficacy Pre-Survey

	Not at All	A little	Some of the Time	Most of the Time	All the Time
I help make choices about what we will eat for dinner.					
I help pick out items when we go grocery shopping.					
I like to eat vegetables.					
I like to eat fruit.					

Thank you and I will see you at the cooking class!

Appendix 3

Adult Self-Efficacy Post-Intervention Survey

G.E.T.T. Cooking Summer 2015 Adult Self-Efficacy Post-Survey

Family Code: _____ Participant code: _____

Thank you for taking the time to fill this survey out! Please answer the questions as best as you can and as truthfully as you can. There are no wrong or right answers.

Due to the skills I learned in the cooking class, I now...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
...feel more comfortable preparing baked chicken.					
...feel more comfortable preparing a casserole.					
...feel more comfortable preparing lasagna.					
...feel more comfortable preparing complex dishes, such as Beef Wellington.					
...feel more comfortable preparing seafood dishes, including fish and shellfish.					
...feel more comfortable preparing poultry dishes					
...feel more comfortable preparing meat dishes.					
...feel more comfortable using herbs and spices when I cook.					

G.E.T.T. Cooking Summer 2015 Adult Self-Efficacy Post-Survey

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
...feel more comfortable preparing dishes from cultural backgrounds other than mine.					
...feel more comfortable seeking out recipes from cultural backgrounds other than mine.					

Please provide any comments about how the cooking class has changed (for better or worse) your cooking skills.

Please provide any comments (positive and negative) about the recipes that were prepared.

Would there be anything you would change, add, or remove from the cooking class?

Have you changed any dietary or shopping behaviors as a result from something you learned from the cooking class?

Appendix 4

Child Self-Efficacy Post-Intervention Survey

G.E.T.T. Cooking Summer 2015 Child Self-Efficacy Post-Survey

After the cooking class, do you think you and your family eat a lot of meals outside of the house?

- No
- A Little
- Sometimes
- Most of the Time
- Yes

The following questions are about how you feel and what you do in your house with your parents. Place an x or □ inside the box that best answers the question for you.

After the cooking class, I...

	Not at All	A little	Some of the Time	Most of the Time	All the Time
...feel more comfortable peeling fruits and vegetables.					
...feel more comfortable cutting fruits and vegetables.					
...feel more comfortable touching raw meats like chicken and pork.					
...feel more comfortable touching cooked meats like chicken and pork.					
... feel more comfortable touching raw fish.					
...feel more comfortable touching cooked fish.					
...feel more comfortable making a green salad on my own.					
...feel more comfortable cooking meats like chicken or pork.					

G.E.T.T. Cooking Summer 2015 Child Self-Efficacy Post-Survey

	Not at All	A little	Some of the Time	Most of the Time	All the Time
...feel more comfortable using knives to help in cooking.					
...feel more comfortable boiling water for cooking rice or pasta.					
...like helping out more when my mom or dad is cooking.					
...ask to help out with cooking more.					
...help make choices about what we will eat for dinner.					
...help pick out items when we go grocery shopping.					
...eat more vegetables.					
...eat more fruit.					
...try more vegetables.					
...try more fruits.					

Thank you and remember to G.E.T.T. Cooking!

Appendix 5

EFNEP Eating Right Survey

EFNEP Eating Right Survey — *ENTRY*

Name: _____ **Date:** _____

This is a survey about ways you plan and fix foods for your family. As you read each question, think about the recent past. This is not a test! There are not any wrong answers.

For these questions, think about how you usually do things. Please put a check in the box that best answers each question.	**Not Applicable 0**	**Do Not Do 1**	**Seldom 2**	**Sometimes 3**	**Most of the Time 4**	**Almost Always 5**
1. How often do you plan meals ahead of time?	0	1	2	3	4	5
2. How often do you compare prices before you buy food?	0	1	2	3	4	5
3. How often do you run out of food before the end of the month?	0	1	2	3	4	5
4. How often do you shop with a grocery list?	0	1	2	3	4	5
5. This question is about meat and dairy foods. How often do you let these foods sit out for more than two hours?	0	1	2	3	4	5
6. How often do you thaw frozen foods at room temperature?	0	1	2	3	4	5
7. When deciding what to feed your family, how often do you think about healthy food choices?	0	1	2	3	4	5
8. How often have you prepared foods without adding salt?	0	1	2	3	4	5
9. How often do you use the "Nutrition Facts" on the food label to make food choices?	0	1	2	3	4	5
10. How often do you or your children eat something in the morning within two hours of waking up?	0	1	2	3	4	5

CLEMSON UNIVERSITY

Appendix 6

EFNEP Nutrition Knowledge Survey K-2nd Grades

K-2 NUTRITION EDUCATION SURVEY

Artwork reproduced by permission from Michigan State University Extension.

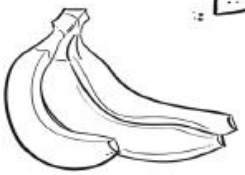
STUDENT ID NUMBER ..... DATE ..... ☐ PRE ☐ POST

DO NOT write your name on this survey.

1. Circle the healthy snacks.

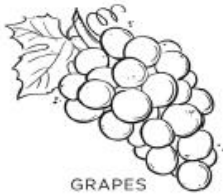
APPLE

CAKE



BANANAS

CARROTS

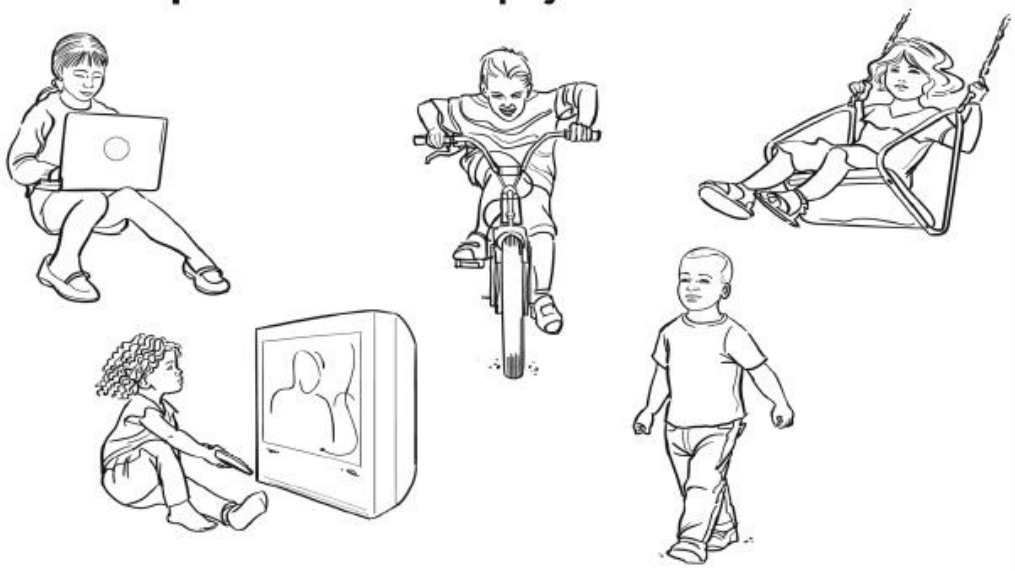


GRAPES

FRENCH FRIES

2. Circle when you should wash your hands before eating.

3. Circle the pictures that show physical activities.

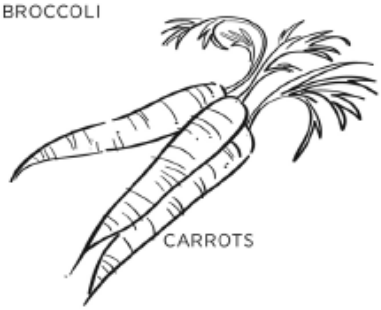


4. Circle the foods from the vegetable group.

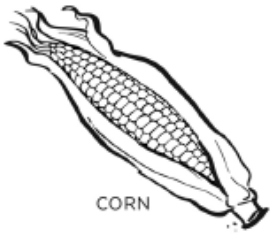

BROCCOLI


TURKEY

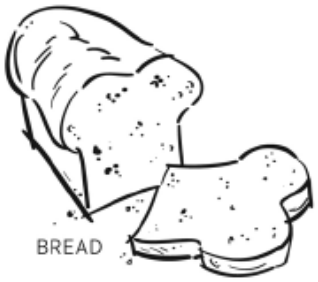

CAKE


CARROTS


PRETZEL


CORN

5. Circle the foods from the fruit group.


BREAD


APPLE

MILK


STRAWBERRIES


FRENCH FRIES


BANANAS

6. Circle the foods from the grains group.

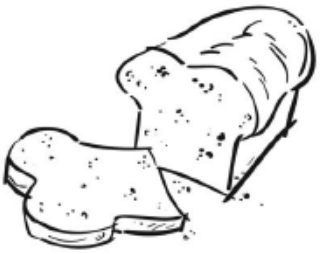

CEREAL


SPAGHETTI


PUMPKIN


BANANAS


CANDY


BREAD

7. Circle the foods from the dairy group.


FRENCH FRIES


PUMPKIN


CANDY


ICE CREAM

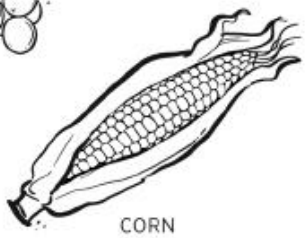

CHEESE

MILK

8. Circle the foods from the protein foods group.

GRAPES

TURKEY



CORN

EGG

Circle your answer.

9. At your home, do you have vegetables to eat?

Never | Almost Never | Sometimes | Almost Always | Always

Circle your answer.

10. At your home, do you have fruits to eat?

Never | Almost Never | Sometimes | Almost Always | Always

Appendix 7

EFNEP Nutrition Knowledge Survey 3rd-5th Grades

CHECKLIST FOR 3rd – 5th GRADES

STUDENT'S CODE NUMBER _____ DATE _____ ☐ PRE ☐ POST

Circle the answer that best applies to you.

	1	2	3	4
1. I eat vegetables…	Never or almost never	Some days	Most days	Every day
2. I eat fruit…	Never or almost never	Some days	Most days	Every day
3. I choose healthy snacks…	Never or almost never	Some days	Most days	Every day
4. I eat breakfast…	Never or almost never	Some days	Most days	Every day
5. I do physical activities…	Never or almost never	Some days	Most days	Every day

	1	2	3
6. Being active is fun.	I do not agree	I'm not sure	I agree
7. Being active is good for me.	I do not agree	I'm not sure	I agree

Circle the correct answer	1	2	3	4
8. A pizza was left out of the refrigerator all night. What should you do?	Eat the pizza	Smell the pizza and then decide if it's okay to eat.	Put the pizza in the refrigerator	Don't eat the pizza
9. A chicken and rice dish has been in the refrigerator for over a week. What should you do?	Eat the chicken and rice dish.	Smell the chicken and rice dish and then decide if it's okay to eat	Put the chicken and rice dish back in the refrigerator	Don't eat the chicken and the rice dish

Circle the answer that best applies to you

	1	2	3	4
10. I wash my hands before making something to eat.	Almost never	Sometimes	Most of the time	Always

	1	2	3
11. Will you ask your family to buy your favorite fruit or vegetable?	No	Maybe	Yes
12. Will you ask your family to buy non-fat or 1% milk instead of regular whole milk?	No	Maybe	Yes
13. Will you ask your family to have fruits in a place like the refrigerator or a bowl on the table where you can reach them?	No	Maybe	Yes
14. Will you ask your family to have cut-up vegetables in the refrigerator where you can reach them?	No	Maybe	Yes

	1	2	
15. Have you being in a Summer Camp?	No	Yes	Which one:
16. Did you plan meals on the summer camp?	No	Yes	Which one:
17. Had you practice gardening before?	No	Yes	Where:
18. Have you ever had a class about healthy food in a Summer Camp?	No	Yes	What food:
19. If you wanted to be in a Summer Camp do you like to do Zumba for kids and sports?	No	Yes	What other:
20. Are you willing to participate in a Healthy Summer Camp?	No	Yes	Why:

Appendix 8

EFNEP Nutrition Knowledge Survey 6th-8th Grades

CHECKLIST FOR 6th-8th GRADES

STUDENT'S CODE NUMBER _____ DATE _____ ☐ PRE ☐ POST

Circle the answer that best describes you.

	0	1	2	3	4
1. **Yesterday, how many times did you eat vegetables, not counting French fries? Include cooked vegetables, canned vegetables and salads. If you ate 2 different vegetables in a meal or snack, count them as 2 times.**	None	1 time	2 times	3 times	4+ times
2. **Yesterday, how many times did you eat fruit, not counting juice? Include fresh, frozen, canned, and dried fruits. If you ate 2 different fruits in a meal or snack, count them as 2 times.**	None	1 time	2 times	3 times	4+ times
3. **Yesterday, how many times did you drink non-fat or 1% low-fat milk? Include low-fat chocolate or flavored milk, and low-fat milk on cereal.**	None	1 time	2 times	3 times	4+ times
4. **Yesterday, how many times did you drink sweetened drinks like soda, fruit-flavored drinks, sports drinks, energy drinks and vitamin water? Do not include 100% fruit juice.**	None	1 time	2 times	3+ times	

The next 2 questions ask about how often you choose certain foods. Circle the answer that best describes you.

	1	2	3	4	5
5. **When you eat grain products, how often do you eat whole grains, like brown rice instead of white rice, whole grain bread instead of white bread, and whole grain cereals?**	Never	Once in a while	Sometimes	Most of the time	Always
6. **When you eat out at a restaurant**	Never	Once in a	Sometimes	Most of	Always

or fast food place, how often do you make healthy choices when deciding what to eat?		while		the time	

The next 3 questions are about physical activity. Circle the answer that best describes you.

	0	1	2	3	4	5	6	7
7. During the past 7 days, how many days were you physically active for at least 1 hour?	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days

	1	2	3	4	5
8. During the past 7 days, how often were you so active that your heart beat fast and you breathed hard most of the time?	Never	1 time last week	2 times last week	3 times last week	4 or more times last week
9. How many hours a day do you spend watching TV or movies, playing electronic games, or using a computer for something that is not school work?	1 hour or less	2 hours	3 hours	4 hours	5 or more hours

	1	2	3	4	5
10. How often do you wash your hands before eating? Think about eating at school or at home.	Never	Once in a while	Sometimes	Most of the time	Always
11. How often do you wash vegetables and fruits before eating them?	Never	Once in a while	Sometimes	Most of the time	Always
12. When you take foods out of the refrigerator, how often do you put them back within 2 hours?	Never	Once in a while	Sometimes	Most of the time	Always

The next 2 questions ask about your confidence in food preparation.
Circle the answer that best describes you.

	1	2	3	4
13. How confident are you in using measuring cups and measuring spoons?	Not confident	Somewhat confident	Confident	Totally confident
14. How confident are you in following directions in a recipe?	Not confident	Somewhat confident	Confident	Totally confident

Appendix 9

EFNEP Nutrition Knowledge Survey 9th-12th Grades

BEHAVIOR CHECKLIST FOR 9TH – 12TH GRADES

STUDENT'S CODE NUMBER _____ DATE _____ PRE ___ POST ___

DO NOT write your name on this survey.
The answers you give will be kept private. This survey is voluntary.

The first 4 questions ask about food you ate or drank. Circle the answer that best describes you.

	0	1	2	3	4
1. Yesterday, how many times did you eat vegetables, not counting French fries? Include cooked vegetables, canned vegetables and salads. If you ate 2 or more different vegetables in a meal or snack, count each of them in your total number of times.	None	1 time	2 times	3 times	4+ times
2. Yesterday, how many times did you eat fruit, not counting juice? Include fresh, frozen, canned and dried fruits. If you ate 2 or more different fruits in a meal or snack, count each of them in your total number of times.	None	1 time	2 times	3 times	4+ times
3. Yesterday, how many times did you drink nonfat or 1% low-fat milk? Include low-fat chocolate or flavored milk, and low-fat milk on cereal.	None	1 time	2 times	3 times	4+ times
4. Yesterday, how many times did you drink sweetened drinks like soda, fruit-flavored drinks, sports drinks, energy drinks and vitamin water? Do not include 100% fruit juice.	None	1 time	2 times	3 times	

BEHAVIOR CHECKLIST FOR 9TH – 12TH GRADES

The next 2 questions ask about how often you choose certain foods.
Circle the answer that best describes you.

	1	2	3	4	5
5. When you eat grain products, how often do you eat whole grains, like brown rice instead of white rice, whole grain bread instead of white bread, and whole grain cereals?	Never	Once in a while	Sometimes	Most of the time	Always
6. When you eat out at a restaurant or fast food place, how often do you make healthy choices when deciding what to eat?	Never	Once in a while	Sometimes	Most of the time	Always

The next 3 questions are about physical activity. Circle the answer that best describes you.

	0	1	2	3	4	5	6	7
7. During the past 7 days, how many days were you physically active for at least 1 hour?	O days	1 day	2 days	3 days	4 days	5 days	6 days	7 days

	1	2	3	4	5
8. During the past 7 days, how often were you so active that your heart beat fast and you breathed hard most of the time?	Never	1 time last week	2 times last week	3 times last week	4 or more times last week
9. How many hours a day do you spend watching TV or movies, playing electronic games, or using a computer for something that is not school work?	1 hour or less	2 hours	3 hours	4 hours	5 or more hours

BEHAVIOR CHECKLIST FOR 9TH – 12TH GRADES

The next 5 questions ask about how you handle food. Circle the answer that best describes you.

	1	2	3	4	5
10. How often do you wash your hands before preparing something to eat? Think about preparing snacks or meals.	Never	Once in a while	Sometimes	Most of the time	Always
11. How often do you wash vegetables and fruits before eating them?	Never	Once in a while	Sometimes	Most of the time	Always
12. When you take foods out of the refrigerator, how often do you put them back within 2 hours?	Never	Once in a while	Sometimes	Most of the time	Always
13. How often do you check the expiration date before eating or drinking foods?	Never	Once in a while	Sometimes	Most of the time	Always

	0	1	2	3	4	5
14. In the last month, if your family did not have enough food, how often did you help by going to a food pantry or finding other free or low-cost food resources?	Does not apply	Never	1 time	2 times	3 times	4 or more times

Appendix 10

G.E.T.T. Cooking Pre-Intervention Questionnaire

G.E.T.T. Cooking Summer 2015 Adult Pre-Survey

Family Code: _____ Participant code: _____

Thank you for taking the opportunity to fill this survey out. Please answer the questions as truthfully as possible. When answering the questions, please keep in mind your household, unless the question specifies to answer only about yourself. If you have any questions or concerns, please contact Elizabeth Ramirez at eramire@clemson.edu or 434-466-7849.

The following questions are some general demographic questions.

How many people, including yourself, live in your household? _____

How many of these people are adults (age 18 and above)? _____

How many of these people are children under the age of 5? _____

How many of these people are age 5 and above? _____

Do you consider yourself Hispanic/Latino?
- ❍ Yes
- ❍ No

Which race category do you identify with? Please choose all that apply.
- ❑ American Indian or Alaskan native
- ❑ Asian
- ❑ Black of African American
- ❑ Native Hawaiian or Other Pacific Islander
- ❑ White

What is the highest level of education that you have completed?
- ❍ Some high school
- ❍ Grade 12 or GED
- ❍ Some College
- ❍ Trade School (i.e. mechanic, cosmetology)
- ❍ Graduated 2-Year College
- ❍ Graduated 4-Year College
- ❍ Post Graduate

How many hours per week do you work?
- ❍ Less than 10
- ❍ 10-20 hours
- ❍ 20-30 hours
- ❍ 30-40 hours
- ❍ over 40 hours
- ❍ Unemployed
- ❍ Retired
- ❍ I volunteer a lot of my time

Do you have a spouse, partner, or other adult that shares in the cooking and grocery shopping responsibilities?
- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To Where do you live? It is marked with a ➔.

Is your spouse, partner, or other adult Hispanic or Latino?
- ❑ Yes
- ❑ No

Which race category does your spouse, partner, or other adult identify with?
- ❍ American Indian or Alaskan Native
- ❍ Asian
- ❍ Black or African American
- ❍ Native Hawaiian or Other Pacific Islander
- ❍ White

What is the highest level of education your spouse, partner, or other adult has completed?
- ❍ Some high school
- ❍ Grade 12 or GED
- ❍ Some college
- ❍ Trade school (i.e. mechanic, cosmetology)
- ❍ Graduated 2-Year College
- ❍ Graduate 4-Year College
- ❍ Post Graduate

How many hours per week does your spouse, partner, or other adult work?
- ❍ Less than 10 hours
- ❍ 10-20 hours
- ❍ 21-30 hours
- ❍ 31-40 hours
- ❍ Over 40 hours
- ❍ Unemployed

➔Where do you live?
- ❍ Farm
- ❍ Town under 10,000 and rural non-farm
- ❍ Town or city 10,000-50,000
- ❍ Suburbs of city over 50,000
- ❍ Central city over 50,000

Do you use any of the following on a usual basis? Please select all that apply.
- ❑ Facebook
- ❑ Twitter
- ❑ YouTube
- ❑ Pinterest
- ❑ Vimeo
- ❑ Instagram

How often do you see your grandchildren?
- ❍ Every day
- ❍ 2-3 times per week
- ❍ Once per week
- ❍ 2-3 times per month
- ❍ Once per month
- ❍ Only on Holidays

The following questions are about your family income and food resources.

What was the total income of your household, before taxes, in the past year?
- ❍ Below $20,000
- ❍ $20,001-$30,000
- ❍ $30,001-$40,000
- ❍ $40,001-$50,000
- ❍ Over $50,000

Does your family currently receive SNAP (Supplemental Nutrition Assistance Program, i.e. Food Stamps) benefits?

- ❍ Yes
- ❍ No

If so, how much do you receive per month?

_____

About how much does your family spend on groceries per month?

_____

The following questions address any food allergies you or your family may have.

Q30 Do you or any of your participating grandchildren have any food allergies?

- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To The following questions are about you...➔

Q31 If so, what are those allergies?

_____
_____
_____

➔The following questions are about your access to food.

Where do you do most of your grocery shopping? Select all that apply.

- ❑ Supermarket (i.e. Bi-Lo, Food Lion, Ingles)
- ❑ Megamarts (i.e. Walmart, Kmart)
- ❑ Farmer's Market
- ❑ Convenience stores (i.e. gas station, corner store, drug store)
- ❑ Food bank
- ❑ Other _____

How far do you have to travel in order to shop for groceries?

- ❍ Less than 10 minutes
- ❍ 10-15 minutes
- ❍ 15-20 minutes
- ❍ 20-25 minutes
- ❍ more than 25 minutes

How often do you go grocery shopping?

- ❍ Less than Once a Month
- ❍ Once a Month
- ❍ 2-3 Times a Month
- ❍ Once a Week
- ❍ 2-3 Times a Week
- ❍ Daily

The following questions address factors influencing how often you cook.

Please determine how much you agree or disagree with each statement below. Please be as truthful as possible. There are no wrong or right answers.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Due to my job or volunteer requirements, I don't have the time to cook as often as I would like.					
I don't have the access to fresh foods necessary to cook (healthy) family meals.					
I feel I don't have the skills to cook (healthy) meals for my family.					

The following questions address factors associated with your family meals and factors affecting how often your family eats together.

Please determine how much you agree or disagree with each statement below. Please be as truthful as possible. There are no wrong or right answers.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I make an effort to have my grandchildren participate in meal planning					
I make an effort to have my grandchildren participate in meal preparation/meal cooking.					
It is important that my grandchildren and I eat our meals together.					
I make an effort to introduce new foods to my grandchildren.					
It is difficult to make a meal that both my grandchildren and I are willing to eat.					
At least one of my grandchildren is a picky eater.					
I feel I am a picky eater.					
Due to my health, I have to follow a strict diet.					
I follow a balanced diet in order to keep me healthy.					

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
When my grandchildren and I sit to eat a meal, we turn off all distractions such as cell phones and tvs.					
I feel I understand nutritional labels on foods.					
I find it physically difficult to cook on a regular basis.					
Due to not having any kids at home, I don't cook as often as I used to.					
I feel I eat out a lot.					

The following questions are about some of the foods you normally buy.

The majority of the fruits I buy are
- ❍ Fresh
- ❍ Frozen
- ❍ Canned
- ❍ Dried
- ❍ I don't buy fruits.

The majority of the vegetables I buy are
- ❍ Fresh
- ❍ Frozen
- ❍ Canned
- ❍ Dried
- ❍ I don't buy vegetables.

The milk I normally drink is
- ❍ Skim milk (0%)
- ❍ Low fat milk (1%)
- ❍ Reduced fat milk (2%)
- ❍ Whole milk
- ❍ Powdered milk
- ❍ Canned milk (i.e. evaporated milk)
- ❍ Non dairy milk (i.e. almond, coconut, soy)
- ❍ I do not buy milk.

How often do you have soda or sugar-sweetened beverages at home? Please do not include diet sodas or 100% fruit juice.
- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ All of the Time

How often do you have whole grain items, such as whole grain breads, pastas, and rice, at home?
- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ All of the Time

G.E.T.T. Cooking Summer 2015 Adult Pre-Survey

The following questions are about your grandchildren's involvement with cooking.

Please determine how much you agree or disagree with the following statements. Please be as truthful as possible. There are not wrong or right answers.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
When considering what to make for dinner, I ask my grandchildren for their opinion.					
I make an effort to get my grandkids involved in helping me prepare dinner.					
My grandchildren enjoy helping me cook.					
My grandchildren feel comfortable in the kitchen.					
My grandchildren help me pick out foods when we go grocery shopping.					
I take the opportunity to teach my grandchildren about cooking.					
I take the opportunity to teach my grandchildren about how to pick out produce at the grocery store or farmer's market.					

The following questions are about how much time you spend cooking and where you most often eat family meals.

How many hours per week do you, and any other member of your family, normally spend preparing food for your family?

- ❍ 0-5 hours
- ❍ 6-10 hours
- ❍ 11-15 hours
- ❍ 16-20 hours
- ❍ Over 20 hours

In any given week, how many times does your family eat at a fast food restaurant, including snacks?

- ❍ 1-2 times
- ❍ 3-4 times
- ❍ 4-5 times
- ❍ More than 5 times

Do you have a home garden or grow fruits, vegetables, or herbs at home?

- ❍ Yes
- ❍ No

If so, what do you grow and how much do you produce per week?

_____
_____
_____
_____

Thank you for taking the time to fill out this survey. If you have any questions about any items of the survey, please contact Elizabeth Ramirez at eramire@clemson.edu or 434-466-7849. Thank you!

Appendix 11

G.E.T.T. Cooking Post-Intervention Questionnaire

G.E.T.T. Cooking Summer 2015 Adult Post-Survey

Family Code: _____ Participant code: _____

Thank you for taking the opportunity to fill this survey out. Please answer the questions as truthfully as possible. When answering the questions, please keep in mind your household, unless the question specifies to answer only about yourself. If you have any questions or concerns, please contact Elizabeth Ramirez at eramire@clemson.edu or 434-466-7849.

The following questions address factors associated with your family meals and factors affecting how often your family eats together.

Please determine how much you agree or disagree with each statement below. Please be as truthful as possible. There are no wrong or right answers.

After the cooking class, I...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
...make more of an effort to have my grandchildren participate in meal planning					
...make more of an effort to have my grandchildren participate in meal preparation/meal cooking.					
...feel it is important that my grandchildren and I eat our meals together.					
...make more of an effort to introduce new foods to my grandchildren.					
...find it difficult to make a meal that both I and my grandchildren are willing to eat.					

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
...find my grandchildren are less of a picky eater.					
...feel I am less of a picky eater.					
...feel I have the skills to follow a healthy diet.					
...make an effort to turn all distractions off when eating a meal grandchildren .					
...make an effort to turn all distractions off when eating a meal with my spouse .					
...feel I understand nutritional labels on foods better.					
...find it easier to cook smaller meals at home.					
...feel I have reduced the amount I eat out.					

The following questions are about some of the foods after taking the cooking class.

The majority of the fruits I buy are

- ❍ Fresh
- ❍ Frozen
- ❍ Canned
- ❍ Dried
- ❍ I don't buy fruits.

The majority of the vegetables I buy are
- ❍ Fresh
- ❍ Frozen
- ❍ Canned
- ❍ Dried
- ❍ I don't buy vegetables.

The milk I now drink is
- ❍ Skim milk (0%)
- ❍ Low fat milk (1%)
- ❍ Reduced fat milk (2%)
- ❍ Whole milk
- ❍ Powdered milk
- ❍ Canned milk (i.e. evaporated milk)
- ❍ Non dairy milk (i.e. almond, coconut, soy)
- ❍ I do not buy milk.

How often do you have soda or sugar-sweetened beverages at home? Please do not include diet sodas or 100% fruit juice.
- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ All of the Time

How often do you have whole grain items, such as whole grain breads, pastas, and rice, at home?
- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ All of the Time

The following questions are about your grandchildren's involvement with cooking.

Please determine how much you agree or disagree with the following statements. Please be as truthful as possible. There are no wrong or right answers.

After the cooking class, I...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
... ask my grandchildren for their opinion when considering what to make for dinner.					
...make more of an effort to get my grandkids involved in helping me prepare dinner.					
...feel my grandchildren enjoy helping me cook more.					
...feel my grandchildren feel more comfortable in the kitchen.					
...make an effort to have my grandchildren pick out foods when we go grocery shopping.					
...take the opportunity to teach my grandchildren about cooking.					
...take the opportunity to teach my grandchildren about how to pick out produce at the grocery store or farmer's market.					

The following questions are about how much time you spend cooking and where you most often eat family meals.

How many hours per week do you, and any other member of your family, normally spend preparing food for your family?

- ❍ 0-5 hours
- ❍ 6-10 hours
- ❍ 11-15 hours
- ❍ 16-20 hours
- ❍ Over 20 hours

In any given week, how many times does your family eat at a fast food restaurant, including snacks?

- ❍ 1-2 times
- ❍ 3-4 times
- ❍ 4-5 times
- ❍ More than 5 times

What do you feel has been the impact on your family (you and your spouse) from participating in the class?

_____
_____
_____
_____
_____
_____
_____

What do you feel has been the impact on your grandchildren from participating in the class?

_____
_____
_____
_____
_____
_____
_____

Thank you for taking the time to fill out this survey. If you have any questions about any items of the survey, please contact Elizabeth Ramirez at eramire@clemson.edu or 434-466-7849. Thank you!

Appendix 12

Follow-Up Interview Questions

Questions for children

1. What are some of the things that you remember we did in the cooking class?
2. Are you putting to practice at home any of the skills that you learned in the class?
3. What are some of the things that you are doing at home in terms of cooking?
4. Are you helping out more at home with cooking? In what ways?
5. How many times per week do you guys eat dinner together now?
6. What are some of the dishes you have helped prepare?
7. What are some of the ways that you are being more involved?
8. Are you using any of the tools from the toolkit?
9. Are you checking off the goals from your goal sheet?
10. Do you think the cooking class was helpful or useful? How?
11. Have you tried any new foods?
12. Would there be anything you would change about the class?
13. Anything you like or didn't like about the classes?

Questions for the parents

1. What changes have you seen in your child after the cooking class?
2. Are they being more involved in cooking planning and/ or preparation?
3. Do they mention things that they learned in the cooking class? Examples?
4. Are they using the toolkit? Did you already have those items at home?
5. Are they following through with the goal sheet?
6. What kind of impact do you feel the cooking class had on your children?
7. Have they tried any new foods?
8. Would there be anything you would have liked them to learn?

Questions for grandparents

1. What items stand out for your from the cooking class?
2. Have you changed any of your habits due to the cooking class?
3. Are there any lessons that stood out to you or that were new to you?
4. How do you feel the cooking class will shape future interactions with your grandchildren in terms of food and cooking?
5. Do you feel the cooking class was beneficial to your grandchildren? To you?
6. Have you seen your grandchildren since the cooking classes took place?
7. For the pairings, would this be something you would like to participate in the future?
8. For the pairings, what value do you think the children received from this? What value did you receive from it?
9. Looking back, what did you like or didn't like from the class?

Appendix 13

Frequency of Responses to Access to Food Questions

Where do you do most of your grocery shopping?		
	1st Selection	2nd Selection
Supermarket (i.e. Bi-Lo, Food Lion, Ingles)	83.30%	-
Megamarts (i.e. Walmart, Kmart)	16.70%	50.00%
Farmer's Market	-	-
Convenience Stores (i.e. gas station, corner store, drug store)	-	-
Food Bank	-	-
Other	-	-

How far do you have to travel in order to shop for groceries?	
Less than 10 mins	83.30%
10-15 mins	16.70%
15-20 mins	-
20-25 mins	-
More than 25 mins	-

How often do you go grocery shopping?	
Less than 1/mth	-
Once per mth	-
2-3 Times/mth	16.70%
Once per week	50.00%
2-3 Times/wk	33.30%
Daily	-

Appendix 14

Frequency of Responses to Types of foods Consumed for Four Major Food Groups

The majority of the fruits I buy are…		
	Pre	**Post**
Fresh	100.00%	100.00%
Frozen	-	-
Canned	-	-
Dried	-	-
I don't buy fruits	-	-

The majority of the vegetables I buy are…		
	Pre	**Post**
Fresh	83.30%	50.00%
Frozen	16.70%	50.00%
Canned	-	-
Dried	-	-
I don't buy fruits	-	-

How often do you have soda or sugar-sweetened beverages at home? Please do not include diet sodas or 100% fruit juice.		
	Pre	**Post**
Never	33.30%	16.70%
Rarely	33.30%	50.00%
Sometimes	16.70%	16.70%
Often	16.70%	16.60%
All of the time	-	-

How often do you have whole grain items, such as whole grain breads, pastas, and rice at home?		
	Pre	**Post**
Never	-	-
Rarely	-	-
Sometimes	-	33.33%
Often	83.30%	33.33%
All of the time	16.70%	33.34%

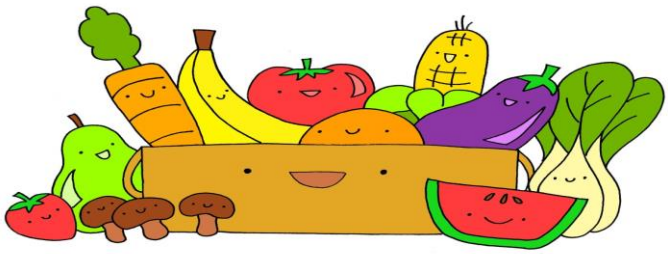
The milk I normally drink is…		
	Pre	**Post**
Skim milk (0%)	33.30%	50.00%
Low fat milk (1%)	33.30%	16.70%
Reduced fat milk (2%)	16.70%	16.70%
Whole milk	-	-
Powdered milk	-	-
Canned milk (i.e. evaporated milk)	-	-
Non dairy milk (i.e. almond, coconut, soy)	-	16.70%
I do not buy milk	-	-
Other	16.70%	-

Appendix 15

Goal Sheet

Make a goal to place a checkmark by each of the statements everyday for a happy and balanced life!

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
I ate at least 1 vegetable today.							
I ate at least 1 fruit today.							
I ate at least 1 serving of dairy today.							
I helped prepare today's meal.							
I helped clean the kitchen.							
I helped plan today's meal.							
I drank water today.							
I did at least 60 minutes of physical activity today							



G.E.T.T. Cooking!

Appendix 16

Tool Kit